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Indian River Timber Sale(s)

Final Environmental Impact Statement

Volume II



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Appendix A

Reasons for Scheduling the Environmental Analysis of the Indian River Project Area

REASONS FOR SCHEDULING THE ENVIRONMENTAL ANALYSIS OF THE INDIAN RIVER TIMBER SALE(S)

This Appendix provides a detailed explanation of the rationale for a specific timber sale project and its importance to the multi-year timber program on the Tongass National Forest. To accomplish this, the following questions are answered:

- **Why is Timber from the Tongass National Forest Being Offered for Sale?**
- **What Steps Must Be Completed to Prepare a Sale for Offer?**
- **How does the Forest Service Develop Expectations about the Market Demand for Timber?**
- **How does the Forest Service Maintain an Orderly and Predictable Timber Sale Program?**
- **How Does the Forest Service Decide Where Timber Sale Projects Should be Located?**
- **How Does This Project Fit into the Tongass Timber Program?**
- **Why Can't This Project Be Located Somewhere Else?**

Coordinated timber sale planning is essential for meeting the goals of the Tongass Land Management Plan and to provide an orderly flow of timber to local industry. To determine the volume of timber to offer each year, the Forest Service can look to current market conditions and the level of industry operations. However, the lengthy planning process—of which this document is a part—requires the Forest Service to rely on projections of future harvest levels to decide how many timber sale projects to begin each year. This document explains how the Forest Service uses information about future markets and past experience with the logistics of timber sale planning to determine the volume of timber that needs to be started through this process each year. Using a detailed timber sale schedule that provides information about each sale as it moves through each stage of the planning process, this Appendix explains the rationale and the necessity for completing this particular timber sale project at this point in time.

Why is Timber from the Tongass National Forest Being Offered for Sale?

National Legislation

On a national level, the legislative record is very clear about the role of the timber program in the multiple-use mandate of the National Forests. The Organic Act of 1897, 16 USC 473-481 (partially repealed in 1976) directed the agency to manage the forests in order to "improve and protect the forest ... [and] for the purpose of securing favorable conditions of water flows, and to *furnish a continuous supply of timber* for the use and necessities of the citizens of the United States" (emphasis added). The Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. 528-531, directs the Forest Service to administer Federal lands for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Forest Management Act of 1976 (16 U.S.C. 472a) states that "the Secretary of Agriculture...[may sell, at not less than appraised value, trees, portions of trees, or forest products located on National Forest System Lands." Although the heart of the Act is land management planning, the Act also sets policy direction for timber management and public participation in Forest Service decision making. Under NFMA, the Forest Service was directed to "limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis" (16 U.S.C. 1611)

The NFMA directed the Forest Service to complete land management plans for all units of the National Forest System. Forest Plans were to be developed by an interdisciplinary team to provide for the coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness. The 1979 Tongass National Forest Land and Resource Management Plan was the first to be completed. A revised

Forest Plan was issued in 1997. With regard to timber production, the Record of Decision for the 1997 Plan stated:

> The Tongass National Forest will continue to allow timber harvest while maintaining sustained yield and multiple use goals...Although the maximum amount of timber that could be harvested during the first decade of the Revised Plan implementation is an average of 267 MMBF per year, a level of 200 MMBF or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service is experiencing. Therefore the public can expect the amount of timber to be offered annually to vary between 200 MMBF or less and 267 MMBF.
>
> ...The timber resource will be managed for production of sawtimber and other wood products from timberlands available for sustainable timber harvest, on an even-flow, sustained-yield basis and in an economically efficient manner. We will seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the market demand for the planning cycle...

In April 1999, Under Secretary Jim Lyons elected to modify the 1997 Plan and issue a new Record of Decision (ROD). As stated in the 1999 ROD:

> The Tongass National Forest will continue timber harvest consistent with sustained yield and multiple use goals. The forest-wide standards and guidelines for timber include general direction to "[e]nsure that silvicultural systems other than clearcutting are considered through an appropriate project level analysis process. However, uneven-aged management systems will be limited to areas where yarding equipment suited to selective logging can be used"...
>
> Forest-wide, considering all land allocations where timber harvest is permitted, it is estimated that 65 percent of harvesting will involve clearcutting, with the remaining 35 percent utilizing other methods.
>
> ...the ASQ for the next 10 years on the Tongass is reduced from an estimated average annual level of 267 MMBF in the 1997 ROD to 187 MMBF in the 1999 ROD, considering both NIC I and NIC II. Although initially this would seem to be a significant reduction in the ASQ, this ceiling for timber harvests from the Tongass remains sufficient to meet all but the most optimistic projections for timber demand and harvests from the Forest for the next decade. I believe that the additional environmental and multiple use benefits provided by this decision should not result in negative social and economic impacts based upon the most current demand for timber.

In day to day operation of the Tongass timber program, the Forest Service attempts to strike a balance among timber availability as documented in the Forest Plan, the market demand for timber in Southeast Alaska, the needs and desires of other forest users, and funding allocations made by Congress.

Alaska-Specific Legislation

Legislation unique to Alaska also directs the Forest Service to maintain a commercial timber program. The Alaska National Interest Lands Conservation Act (ANILCA; P.L. 96-487, 1980) and the Tongass Timber Reform Act (TTRA; P.L. 101-625, 1990) speak directly to the issue of Tongass timber supply. Section 705(a) of ANILCA directed the Forest Service to maintain a timber supply from the Tongass at a rate of four billion five hundred million board feet per decade. To ensure that the timber target was met, Congress provided for a $40 million annual earmark to fund pre-roading, cultural treatments and innovated logging systems.

Section 101 of TTRA repealed the timber supply mandate and fixed appropriations of ANILCA and replaced them with the following more general direction:

> Sec. 705. (a), Subject to appropriations, other applicable law, and the requirements of the National Forest Management Act (P.L. 94-588); except as provided in subsection 9d) of this section, the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the annual market demand from such forest for each planning cycle.

Timber from the Tongass National Forest is being offered as part of the multiple use mission of the Forest Service as identified in public laws. Alaska-specific legislation and the Forest Plan directs the Forest Service to seek to provide timber to meet market demand subject to appropriations and balancing of forest uses.

What Steps Must Be Completed to Prepare a Sale for Offer?

The timber sale program is complex. A number of projects are underway at any given point in time, each of which may be in a different stage of planning and preparation. A system of checkpoints, or "gates", helps the Forest Service track the significant milestones of each project from inception to contract termination, followed by monitoring, reforestation, and timber stand improvement. Each project passes through all of the following gates, with the complexity of the sale determining the complexity of the final product at each stage.

Gate 1: Completion of Position Statement. The Position Statement is a brief analysis of the project area with the intent of determining the feasibility of the potential timber sale. This is the first step in the timber sale planning process and it is usually completed from seven to ten years before a sale is offered. After the Position Statement is developed, the Forest Service decides whether to continue to the next phase of the project where a significant investment in time and money will be made.

Gate 2: Sale Area Design, Environmental Documentation and Decision. This phase of the project is commonly referred to as the "NEPA" phase and includes inventory, public scoping, analysis, draft disclosure of the effects of the project on the environment, public comment, final analysis and disclosure, decision, potential appeal, and litigation. Gate 2 activities are generally completed two to six years before a sale is offered. The end product of this phase, an environmental decision document, forms the starting point for the next phase.

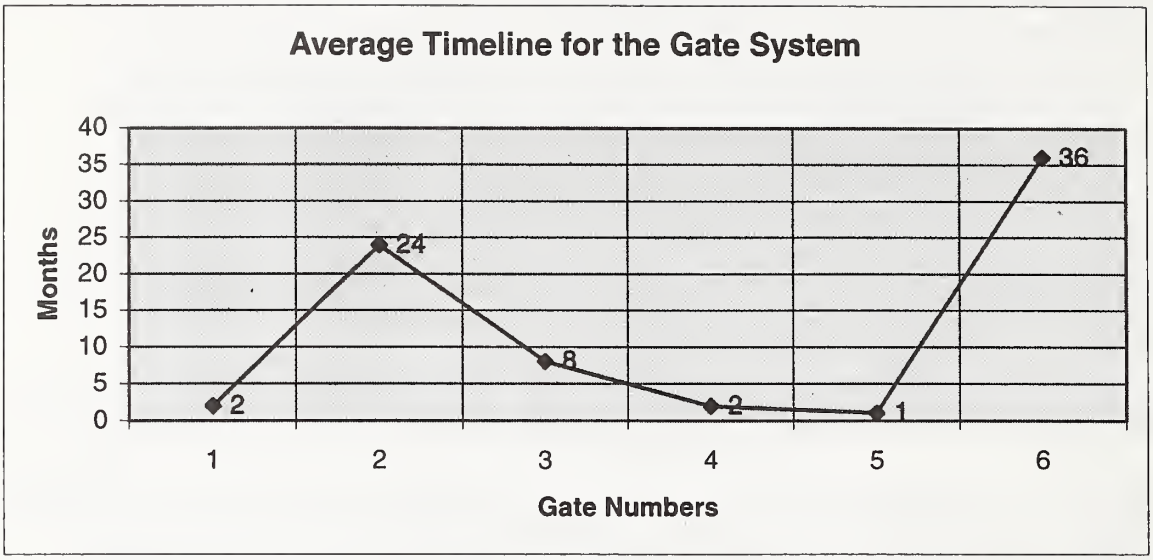
Gate 3: Plan Implementation and Field Layout. Gate 3 activities are typically completed one to three years before a sale is offered. During this phase, the information and direction included in the decision document (Gate 2) is used to designate the actual project on the ground. Additional site-specific information is collected at this time.

Gate 4: Appraisal Offering Package. The costs and value associated with the timber sale designed in Gate 3 are computed and packaged in a timber sale contract. The contract tells the prospective timber sale purchaser how the sale must be harvested to be in conformance to the project decision document. This phase of the Gate system occurs during the final year of the project development and culminates with the advertisement of the project for sale.

Gate 5: Bid Opening. Gate 5 is completed with the opening of bids for the project. If a bid is submitted, contractual provisions govern when the award of the sale takes place and when the sale will be completed and how timber removal is to occur.

Gate 6: Award. Gate 6 is the formal designation of a contract between a bidder and the Forest Service.

Figure 1.



How does the Forest Service Develop Expectations about Future Timber Markets?

The Tongass National Forest makes two determinations on volume to be offered. The first is a determination on volume to be offered for the current year (annual market demand). The annual market demand is analogous to assessing industry performance in the short-term. In the short-run a firm will make use of its existing equipment to maximize profits or minimize losses. The general approach is to consider the timber requirements of the region's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capability. These assumptions provide a basis for estimating the volume of timber likely to be processed by the industry as a whole in any given year. Timber inventory requirements are acknowledged and estimated in a related calculation. The volume of timber likely to be purchased is equal to the volume needed to make up any inventory shortfall in addition to the volume likely to be harvested in the coming year. The document titled *Evaluating the Demand for Tongass Timber* (USDA, Forest Service, R-10; Morse; September 28, 1998) forms the basis for how these estimates are developed. The document titled *Tongass Timber Sale Procedures* (USDA, Forest Service, R-10; Morse, Draft August 30, 1999) documents actual estimates for the current year. This estimate is what the Tongass plans to offer for the current year of the Ten Year Timber Sale Schedule pending sufficient funding to do so.

Based on the analysis documented in *Tongass Timber Sale Procedures*, for Fiscal Year 2000, the Tongass National Forest plans to offer approximately 148 MMBF for sale. The sales planned for offer will be a combination of new, previously offered, or previously offered and reconfigured. Both standing timber and salvage will be components of the program. Offerings will consist of those targeted for Small Business qualified firms as well as a portion of the volume being made available for the open market.

Life of the Forest Plan (Market Demand over the Planning Cycle)

Given the long time involved in preparing a timber sale, the proposed timber sales in this document may not be harvested for 3 to 4 years or longer, not including appeals or litigation. The Forest Service needs some idea of what the long run timber demand will be given cycles in the market. On average what should the Forest Service plan for offer, given that timber from this NEPA document may not be harvested for 4 years into the future? The Forest Service needs to take a long-run view for planning purposes. To answer these questions the Forest Service asked the Pacific Northwest Research Station for professional assistance.

As the Tongass Land Management Plan was being revised in 1997, research economists at the Pacific Northwest Research Station (PNW) were asked to update their earlier projections of Alaska timber products output and timber harvest by ownership. The most recent projections of timber harvest over the planning cycle account for several dramatic changes in the region's manufacturing capabilities, increased competition from a number of sources, and the steady erosion of North America's share of Japanese timber markets.

The Tongass documents these projections and the means of implementation through the issuance of a Ten Year Timber Sale Schedule. Each year this plan is updated whereby the current year is dropped at the culmination of the fiscal year and a new year ten is added. The basis for this schedule is long range timber market projections documented in the publication titled *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997). These projections of Alaska timber products output, the derived demand for raw material, and timber harvest by owner are developed from a trend-based analysis. These projections reflect the consequences of recent changes in the Alaska forest sector and long-term trends in markets for Alaska products. With the closure of the two southeast Alaska pulp mills, demand for Alaska National Forest timber now depends on markets for sawn wood and the ability to export manufacturing residues and lower grade logs. Three alternative projections are used to display a range of possible future demand (Table 1). Areas of uncertainty include the prospect of continuing changes in markets and in conditions faced by competitors and the speed and magnitude in investment in manufacturing in Alaska.

Demand projections are important for program planning. They provide important guidance to the Forest Service for requesting budgets, for making decisions about workforce and facilities, and for indicating the need to begin new NEPA analysis for future program offerings. They also provide a basis for expectations regarding future harvest, and thus provide an important source of information for establishing the schedule of probable future sale offerings. The weight given to the projections will vary depending on a number of factors, such as how recently they were done, and how well they appear to have accounted for recent, site-specific events in the timber markets.

Table 1-Projected National Forest Harvest

For Fiscal Year 2001-2009, the Tongass National Forest plans to schedule approximately 160 MMBF for sale each year over the life of the Forest Plan. This schedule is based on the projections documented in *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997), and current volumes in the timber sale pipeline process. Prior to the beginning of Fiscal Year 2001 the amount of volume scheduled in outyears will once again be analyzed to determine if projections made now meet the anticipated needs in the future.

Fiscal Year	Projected Harvest (MMBF)		
	Low	Medium	High
2000	95.5	116.6	142.7
2001	104.6	129.0	157.7
2002	113.7	134.9	173.1
2003	122.8	140.8	188.9
2004	131.9	146.5	205.0
2005	131.9	152.2	221.4
2006	131.9	157.8	238.2
2007	132.0	163.4	255.3
2008	132.0	168.9	272.8
2009	132.1	174.3	290.7
Average	122.8	148.4	214.6
Mean	168.7		

How does the Forest Service Maintain an Orderly and Predictable Timber Sale Program?

Pools of Timber (Pipeline Volume)

As discussed earlier, the Forest Service tracks accomplishment of various stages of development of each timber sale with the Gate System process. From a timber sale program standpoint, it is also necessary to track and manage multiple projects through time as projects collectively move through the Gate System. Tracking of the multiple projects can be likened to following various segments of several projects through a pipeline of time. Because of the relatively long timeframes needed to accomplish a given timber sale and the complexities inherent in timber sale project and program development, it is necessary to track various timber sale program volumes from Gate 1 through Gate 6. Gate 1 volume represents a large pool of program volume, but represents a relatively low investment from project to project. This relative investment level offers the timber program manager a higher degree of flexibility and thus, does not greatly influence the flow of volume through the pipeline. In addition, tracking of how much volume near the end of the pipeline that is in appeals or litigation may be necessary to determine potential effects on the flow of potential timber sales.

The goal of the Tongass National Forest is to provide an even flow of timber sale offerings on a sustained yield basis. In past years, this has been difficult to accomplish due to continual reductions in the suitable timber land base, reductions in the timber industry processing capabilities, rapid market fluctuations and Forest Plan modifications and litigation. To achieve an even flow of timber sale offerings, 'pools' of projects in various stages of the Gate System will be maintained so volume offered can be balanced against current year demand and market cycle projections. Today, upward trends in demand are reacted to by moving outyear timber projects forward leaving outyears not capable of meeting the needs of the industry. In other instances, a number of new projects are started based on today's market but not available for a number of years. By the time the added projects are ready for offer, the market and demand for this volume has changed. Three pools are being tracked to achieve an even flow of timber sale offerings:

1. **Timber volume under analysis (Gate 2)**: Timber volume under analysis, contains sales being analyzed and undergoing public comment through the NEPA process. This process can often take from one to five years and reaches a significant milestone when a NEPA decision is made. This pool includes any project with a formal Notice of Intent through those with a decision document issued. Volume in appeals and litigation will be tracked as a subset of this pool as necessary.

2. **Timber volume available for sale (Gate 3, Gate 4 and Gate 5)**: Timber volume available for sales, contains sales for which environmental analysis has been completed, and administrative appeals, and litigation (if any) have been resolved. They have also been fully prepared, and are available to managers to schedule for sale offerings. Managers need to maintain enough volume in this pool to be able to schedule future sale offerings in an orderly manner of the size and configuration that best meets the need of the public. As a matter of policy, and sound business practice, the Forest Service attempts to announce probable future sale offerings at least one year in advance. This allows potential purchasers an opportunity to do their own evaluations of these offerings in order to determine whether to bid, and if so, at what level.

3. **Timber volume under contract (Gate 6)**: Timber volume under contract contains sales which have been sold and a contract awarded to a purchaser, but have not yet been fully harvested. Timber contracts typically, but not always, give the purchaser three years to harvest and remove the timber purchased. Long standing Forest Service practice is to attempt to maintain about two to three years of unharvested timber volume under contract to timber purchasers. This volume of timber is the industry's dependable timber supply which allows immediate flexibility in business decision. This practice is not limited to the Alaska Region, but is particularly pertinent to Alaska because of the nature of the land base. The relative absence of roads, the island geography, the steep terrain, and the consequent isolation of much of the timber land means that timber purchasers need longer-than-average lead times to plan operations, stage equipment, set up camps, and construct roads prior to beginning harvest.

What drives the various timber sale program pipeline pool volume is a combination of actual harvest and projected demand. As purchasers harvest timber, they deplete the volume under contract. Managers track harvest, and offer sales that give the industry as-a-whole the opportunity to replace this volume and build or maintain their working inventory. Although there can be significant variation for practical reasons from year to year, in the long-run, over both the high points and low points of the market cycle, timber harvest will equal timber sales.

The amount of pipeline volume in each of the pools is determined by the Forest Service based on historical patterns. Table 2-Pools Matrix displays what volume levels are expected to be maintained in each pool. Pool 1-Timber Volume Under Analysis is expected to be maintained at approximately 4.5 times the amount of anticipated harvest; Pool 2-Timber Volume Available for Sale is expected to be maintained at approximately 1.3 times the amount of anticipated harvest, and Pool 3-Volume Under Contract is expected to be maintained at approximately 3 times the amount of anticipated harvest. The objective of the pools concept is to maintain sufficient volume in preparation and under contract to be able to respond to yearly fluctuations in a timely manner.

Table 2- Pipeline Pool Matrix

Pipeline Pool Volume	Flows	Start of Year One	During Year One	End of Year One
1. Volume Under Analysis **(Gate 2)**		238	401	230
	NEPA Decision	126	343	171
2. Volume Available for Sale **(Gate 3, Gate 4 and Gate 5)**		79	266	159
	Offered		163	
	Sold		148	
3. Volume Under Contract **(Gate 6)**		325		352
	Volume Harvested*		121	
*Note-The amount of volume estimated to be harvested for the year sets the basis for what will be maintained in Pools 1-3 **(Gates 2 through 6).** Should this estimate be incorrect, adjustments can be made in the following years without significant departures in outyear programs capabilities.				

Matrix crosswalk between Gate Tracking System and Pools of Timber Concept:
Gate 2: Proposed timber volume with a published decision document (Record of Decision) that is viable for sale after completion of appeals and litigation.
Gate 3: NEPA cleared timber volume with field preparation work completed and the timber sale ready to be offered in a timber sale contract package.
Gate 6: Timber volume under contract.

Table 2a – Volume in Appeals and Litigation

Timber volume in appeals and/or enjoined in litigation *.	55 Million Board Feet

*As of September 1999. The volume in appeals and or enjoined in litigation is updated on a quarterly basis.

How Does the Forest Service Decide Where Timber Sale Projects Should be Located?

The Allowable Sale Quantity (ASQ)

The Modified 1997 Forest Plan Record of Decision established an ASQ for timber at 1.87 billion board feet per decade, which equates to an annual average of 187 million board feet (MMBF). The ASQ serves as an upper limit on the amount of timber that may be offered for sale as part of the regularly scheduled timber sale program. It consists of two separate Non-Interchangeable Components (NIC's) called NIC I, which is 1.53 billion board feet of timber per decade, and NIC II, which is .34 billion board feet per decade. The purposes of partitioning the ASQ into two components are to maintain the economic sustainability of the timber resource by preventing the over-harvest of the best operable ground, and to identify that portion of the timber supply that is at risk of attainment because of marginal economic conditions. The NIC I component includes lands that can be harvested with normal logging systems. The NIC II component includes land that has high logging costs due to isolation or special equipment requirements. Most of these NIC II lands are presently considered economically and technically marginal.

Immediately following the issuance of the Modified 1997 Forest Plan Record of Decision by the Deputy Under Secretary of Agriculture, James Lyons, the Forest Service began an analysis of the ROD to develop consistent methodologies for its implementation (Implementation of Tongass Land Management Plan, 1920/1950, James A. Bartelme, Forest Supervisor, May 11, 1999). The purpose of the analysis was to develop methodology to ensure the modified Forest Plan changes received a consistent implementation approach across the Tongass, and to determine where the land base existed to begin programming current and future timber sale projects.

The Tongass National Forest has been unified under one Forest Supervisor overseeing the three combined Administrative Areas (Chatham, Stikine and Ketchikan). The allowable sale quantity is disaggregated by Ranger District offices for planning and scheduling purposes. Each District has been allocated a portion of the timber harvest program based on the FORPLAN computer run and availability of suitable and available acres, to implement the Forest Plan, and Section 101 of the Tongass Timber Reform Act (1990). The Forest Plan set the Forest allowable sale quantity (ASQ) upper limit at 187 MMBF per year. The distribution of the planned ASQ harvest among the Districts is listed in Table 3 (All volumes are identified as sawlog plus utility):

Table 3-Distribution of ASQ Among the Tongass National Forest Ranger Districts

Historically, timber harvest activities were generally concentrated in the central and southern portions of the Tongass. Now, under the Modified 1997 Forest Plan, the suitable timber land base is more evenly distributed across the Forest. As a result, it is necessary to lessen harvest on the southern end and begin planning projects in areas further north. In answer to the question presented for this section of the Appendix, the suitable timber base is capable of producing the ASQ documented in the Modified 1997 Forest Plan Record of Decision. However, harvest activities will be more evenly distributed than they were in the past.

Tongass NF Ranger District	Non-Interchangeable Components	
	NIC I	NIC II
Ketchikan	18	4
Thorne Bay	21	5
Craig	18	4
Wrangell	24	4
Petersburg	37	8
Sitka	12	3
Hoonah	6	2
Juneau	12	3
Yakutat	5	1
Admiralty	0	0
NIC Totals	153	34
ASQ Total	187	

Chart 1- 1997 Modified Forest Plan Land Allocations

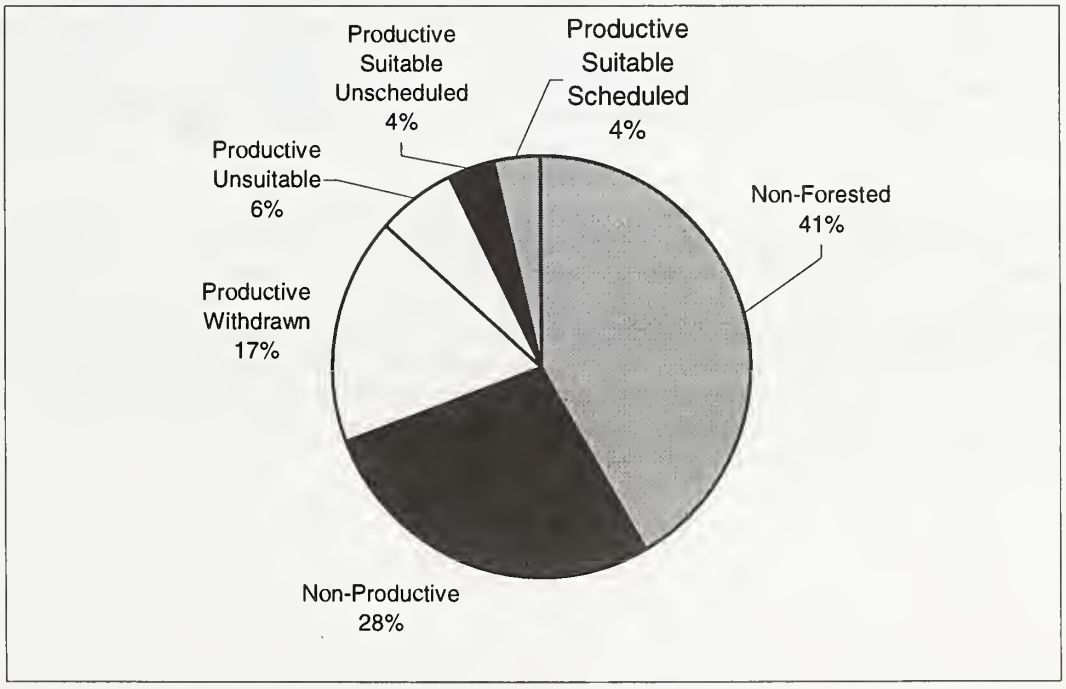


Chart 1- 1997 Modified Forest Plan Land Allocations depicts the productive suitable land base that is scheduled for timber harvest activities. Four percent of the Tongass land base generates the allowable sale quantity of 187 MMBF per year. The remainder of the land, approximately ninety-six percent, does not allow or will not support timber harvest activities.

District-Level Planning

The Forest Supervisor for the Tongass National Forest has discrete responsibilities for the overall management of the Forest's timber sale program. Included within these responsibilities is making the determination on the amount of timber volume to be made available to the industry as described above. Once a determination is made for the current year (annual demand) offer level, the information is presented to Congress via the Regional Forester and Chief of the Forest Service. Whether or not funding is appropriated to attain the program is the responsibility of the Congress and the President of the United States.

While the debate on funding takes place, the Tongass Forest Supervisor directs the District Rangers to formulate timber sale schedules that attain the prescribed offer level for the current year as well as develop outyear timber programs based on projected market demand for the planning cycle. It is the Ranger's role to recommend to the Forest Supervisor timber sale projects that meet forest plan goals and objectives. Districts work on various projects simultaneously resulting in continual movement of projects through the stages of the timber program pipeline. Their schedule allows the necessary time to complete preliminary analysis, resource inventories, environmental documentation, field layout preparations and permit acquisition, appraisal of timber resource values, advertisement of sale characteristics for potential bidders, bid opening, and physical award of the timber sale. Once all of the Rangers' recommendations are made and compiled into a consolidated schedule, the Forest Supervisor is responsible for the review and approval of the final plan.

Pending Congressional appropriations, the sale schedule is implemented. In the event insufficient funds are appropriated to achieve the desired outputs, timber sale projects are selected and implemented on a priority basis. Generally, the higher priority projects include sales where investments such as, road networks, camps or log transfer facilities have already been established. Those sales that are not implemented or only partially implemented are moved to the outyears. The sale schedule becomes very dynamic in nature due to the number of influences on each of the districts. A formal review of the schedule is done annually by the Forest Supervisor in consultation with the District Rangers, and amendments are made as needed through the course of the year. (The Tongass Timber Sale Plan is located on the Tongass National Forest Website)

The National Forest Management Act requires the Forest Service to develop timber sale schedules that encompass the life of the forest plan. The recent Tongass National Forest planning process culminated upon issuance of the Modified 1997 Forest Plan Record of Decision for the Tongass Land and Resource Management Plan. In response to this Plan, the Tongass has prepared a Ten Year Timber Sale Schedule for Fiscal Years 2000-2009. Fiscal Year 2000 offer level is based on annual market demand estimates. The remaining years, 2001-2009 are based on market demand projections over the planning cycle. Table 4-Tongass Ten Year Timber Sale Schedule-Fiscal Year 2000, denotes the first year of the ten-year plan. Fiscal Year 2000 is listed below to show the reader an example of the information available and display the timber sales scheduled for the current fiscal year.

Table 4-Tongass Ten Year Timber Sale Schedule-Fiscal Year 2000

NEPA Decision			S+U	Sale	Vol S+U		FY00 Gate	FY00 Gate	Gate
Project	Date	RD	(MMBF)	Name	(MMBF)	Class	2	3	5
Sea Level EIS	May-99	KRD		Madder	26	S			26
Sea Level EIS	x	KRD		Buckdance	11	S			11
Sea Level EIS	x	KRD		Orion	13	S			13
Craig Small Sales EA	x	CRD	1.5	Craig Small Sales	1.5	S	1.5	1.5	1.5
TNB Small Sales EA	x	TNB	5	Various	5	S	5	5	5
Luck Lake EIS	Jan-00	TNB	13	Luck Lake	5	S	13	5	5
Luck Lake EIS	x	TNB		Twin Bridge	8	S		8	8
Couverdan CE	Jun-00	JRD	0.8	Couverden Salvage	0.8	S	0.8	0.8	0.8
8-FATHOM EIS	Apr-96	HRD		Midway	6.4	S		6.4	6.4
HRD Small Sales EA	x	HRD	0.2	Small sales	0.2	S	0.2	0.2	0.2
NW BARANOF EIS	Feb-96	SRD		Schultz	8	S		1	8
Small Salvage Sale CE	x	YRD	0.2	Small Salvage Sale-00	0.2	S	0.2	0.2	0.2
Woodpecker EIS	(May-00)	PRD	(5-18)	Woodwork	1	S	18	1	1
Twin Creek EA	Aug-98	PRD		Twin Creek heli (41,66)	1.5	S		1.5	1.5
Twin Creek EA	Aug-98	PRD		Twin Creek 15	0.1	S		0.1	0.1
South Lindenberg EIS	Dec-96	PRD		South Central (U140)	1.5	S		1.5	1.5
South Lindenberg EIS	Dec-96	PRD		S.Lindy SE	10	S		10	10
East Fork EA	Jul-88	PRD		East Fork	2	S		2	2
Bohemia Mountain EIS	Jun-95	PRD		Goose (Unit 538)	1	S		1	1
Doughnut EA	x	WRD	8	Doughnut	4	O	8	4	4
Skipping Cow EIS (X)	x	WRD	20	Skipping Cow	20	S	20	20	20
Kuakan EIS	x	WRD	12	Kuakan	12	S	12	12	12
Total			40		138.2		40	81.2	138.2

NOTE: The difference between projected volume (148 MMBF) and offer volume (138 MMBF) will be made up from re-offer/reconfigured unsold FY 98/99 timber sales.

The Ten Year Schedule provides a significant amount of information and is described as follows:

Title	Description
NEPA Project	Environmental document project name. This name may or may not differ from the timber sale project name depending on how many sales originate from the original NEPA document.
Decision Date	The date of the decision document whether planned or actual. 'x' denotes project has started and completion is within the FY noted under column H.
RD	Ranger district office project is located (PRD=Petersburg Ranger District).
S+U (MMBF)	Anticipated timber volume (sawlog plus utility) expected from the NEPA document. Generally only appears once in the year the decision is made. If no volume shown, decision on document was made in another fiscal year.
Sale Name	Timber sale project name.
Vol S+U (MMBF)	Timber sale project volume (sawlog plus utility).
Class	Timber sale size class determination (S-SBA, O=open sale to all bidders).
FY00 Gate 2 (NEPA)	Only appears in the year the NEPA document will be decided. Number designates potential volume.
FY00 Gate 3 (Layout)	Only appears in fiscal year sale is to be laid out and appraised. May appear in more than one year.
FY00 Gate 5 (Offer)	Only appears in fiscal year sale is to be offered. Number designates potential volume.

The location of timber sale projects are based on the land allocation directed in the Forest Plan decision. Timber sales are located where permitted based on the prescription and objectives of the land use designation. Timber sale projects are located to varying degrees in land use designations identified as timber production, modified landscape, and scenic viewshed.

As stated earlier, the District Ranger is responsible for identifying and recommending the project areas for the Ten Year Timber Sale Schedule. The considerations the Ranger makes on each project includes but are not limited to the following:

1. The project area contains a sufficient number of acres allocated to development land use designations to make timber harvest in the area appropriate under the Forest Plan. There is an adequate amount of suitable and available land for timber harvest opportunities. Available information indicates harvest of the amount of timber volume being considered for this project can occur consistent with the Forest Plan standards and guidelines and other resource protection requirements.

2. The project and proposed timber harvest volume can contribute to achieving the goals and objectives of implementing the Forest Plan.

3. The potential investment in infrastructure (roads, bridges, log transfer facilities, camps, rock pits, etc.) is necessary for sustainable timber harvest offerings. Where infrastructure already exists, this project will enable maintenance and upgrade of the facilities, which is necessary for removal of timber volume.

4. The potential effects on subsistence and other resources.

5. Based on current year and anticipated outyear timber volume demand; volume currently under contract; anticipated Congressional allocations; and the availability of resources to fully prepare and offer this project for sale, this project is consistent and meets Forest Service Policy in the

Alaska Region, Regional Guide; Best Management Practices; the Modified 1997 Tongass Land and Resource Management Plan; and all other laws and regulations governing the removal of timber from National Forest System Lands.

How Does This Project Fit into the Tongass Timber Program?

The Indian River Timber Sale(s) Project is scheduled for offer in Fiscal Year 2001, (Tongass National Forest Ten Year Timber Sale Schedule, 1999). Forest-wide, total offer volume being planned for Fiscal Year 2001 is 162.9 MMBF. In order to achieve the planned offer date, the Indian River Project has a scheduled Gate 2 completion date of Fiscal Year 2000 with Gate 3 implementation to begin in Fiscal Year 2000.

The Indian River Timber Sale(s) Project is currently in Gate 2, "Volume Under Analysis". The project's action alternatives being addressed in the NEPA analysis range from 23.4 MMBF to 36.6 MMBF that could contribute to the Tongass Timber Sale Program. As described earlier, the volume of timber needed to maintain the NEPA decision pool during year one is 343 MMBF. Currently, forest-wide the NEPA decision pool contains 126 MMBF exclusive of this project. **Potential** selection of an action alternative for this project would bring the volume in the NEPA decision pool between 149.4 and 162.6 MMBF. Therefore, the Indian River Timber Sale(s) Project is consistent with the program planning objectives and necessary to meet the goal of providing an orderly flow of timber from the Tongass on a sustained yield basis. Given the included information, it is reasonable to be conducting the environmental analysis for this project at this time.

Why Can't This Project Occur Somewhere Else?

As previously discussed, the market demand for timber for the next ten years is expected to average 160 MMBF per year. The suitable and available land base on the Tongass is capable of supporting an Allowable Sale Quantity of 187 MMBF annually, 153 MMBF of which is considered economical (i.e. the NIC I component). Based on the projected market demand for the planning cycle, all suitable timberlands will eventually be scheduled for harvest to meet the current and projected demand for raw material in Southeast Alaska. The cumulative impact on other resources from past harvest activities, the location of timber sales under contract, and the eventual use of all suitable lands for timber sale projects makes the relocation of this project in another area inefficient and potentially contrary to the standards and guidelines of the Forest Plan.

- Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).
- The potential effects on subsistence resources are projected to differ little based on the sequence these areas are harvested. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence use and other factors. Harvest within other areas is foreseeable, in any case over the forest planning horizon under the Forest Plan.
- Providing substantially less timber volume than required to meet Forest Plan and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the project area is not necessary or reasonable.
- It is reasonable to schedule harvest in the project area rather than in other areas at the present time based on previous harvest entry and access, level of controversy over subsistence and other effects, the ability to the complete National Environmental Policy Act (NEPA) process and make timber available to meet the needs of dependent industries. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EIS's that are currently ongoing or scheduled to begin soon.

Appendix B

Biological Assessment and Biological Evaluation

BIOLOGICAL ASSESSMENT AND BIOLOGICAL EVALUATION
FOR
ENDANGERED, THREATENED, SPECIES OF CONCERN, AND SENSITIVE
VERTEBRATE SPECIES
WHICH MAY OCCUR IN THE INDIAN RIVER TIMBER SALE(S) AREA

11/20/96
Date

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INTRODUCTION

This Biological Assessment (BA) and Biological Evaluation (BE) was prepared to fulfill requirements of the Endangered Species Act of 1973, as amended and Forest Service endangered threatened, and sensitive animal species policy (FSM 2670). The purpose of a BA is to determine whether the proposed action (in terms of the action alternatives in the Environmental Impact Statement) is likely to affect an endangered or threatened species, or species of concern. The purpose of a BE is to analyze the possible effects of the proposed action (in terms of the action alternatives in the Environmental Impact Statement) on endangered, threatened, species of concern, and sensitive animal species.

PROJECT DESCRIPTION

PROJECT OVERVIEW

The Tongass National Forest, Sitka and Hoonah Ranger Districts, proposes to harvest 25 to 45 million board feet (MMBF) of timber from the Indian River Project Area. One or two Log Transfer Facilities (LTF) and up to 35 miles of road would be constructed or reconstructed to allow removal of the timber.

PROJECT LOCATION

The Indian River Project Area is located in the Tongass National Forest on Chichagof Island, approximately 56 air miles north of Sitka (Figures 1 and 2). The Project Area encompasses approximately 39,000 acres.

ALTERNATIVES

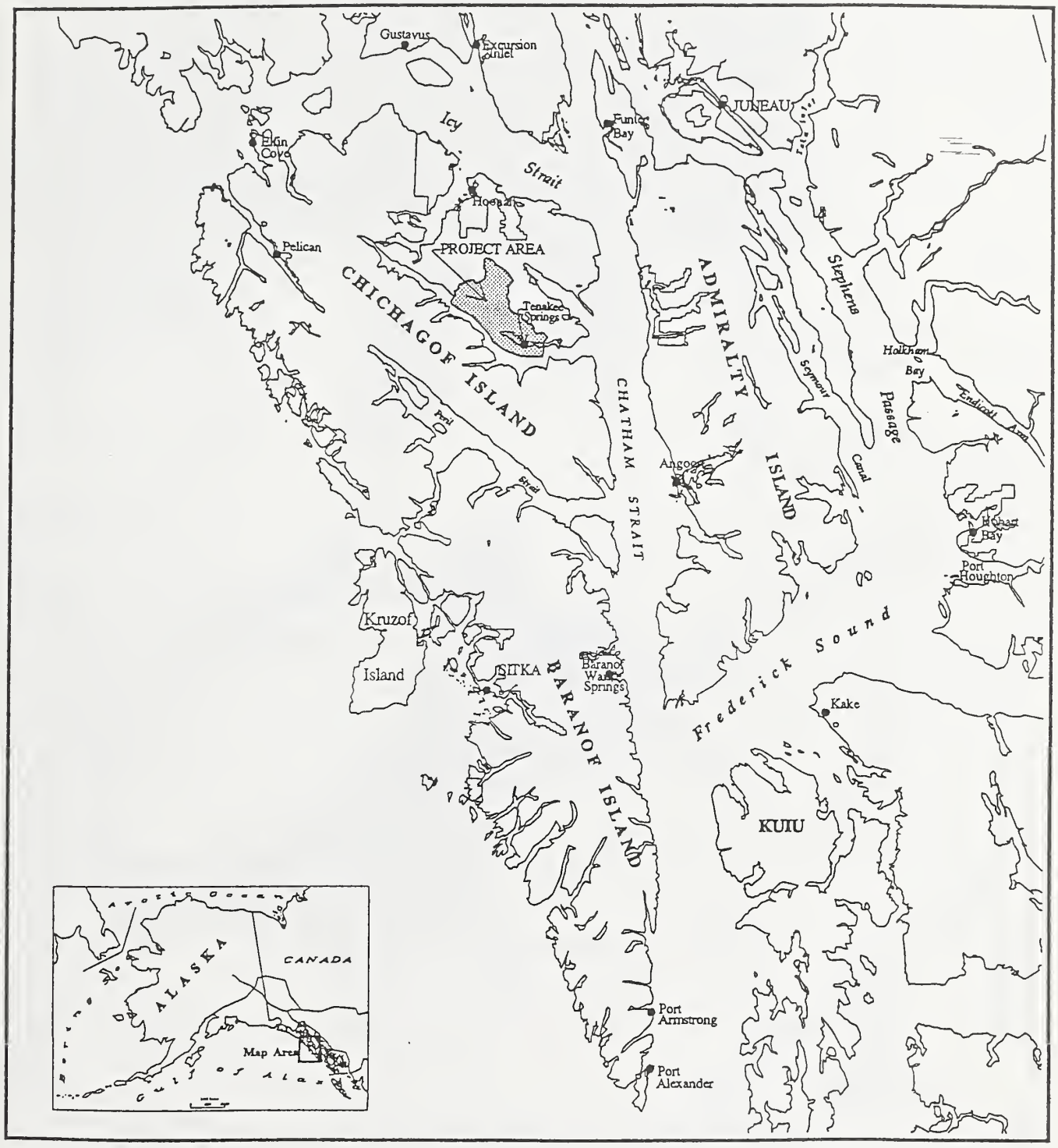
A total of six alternatives, including the No Action Alternative, were developed and evaluated. The action alternatives were each developed to be as site-specific as possible. Collectively, the action alternatives were formulated to explore ways to satisfy public concerns and resolve issues of concern, while responding to the purpose and need for the project.

The five action alternatives differ primarily in harvest intensity (i.e., number of harvest units), miles of road, and number of LTFs. The harvest systems (i.e., clearcut vs. group selection) and yarding systems (i.e., helicopter vs. cable system) are unit-specific and may vary between alternatives. Table 1 summarizes the features of each alternative.

WILDLIFE SPECIES

After consulting (Appendix A) with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Alaska Region Sensitive Species list (FSM 2670), Table 2 was generated. This table describes the endangered, threatened, species of concern, and sensitive species which may occur in the Project Area.

Vicinity Map



Project Area

12 6 0 12 24

Scale in Miles

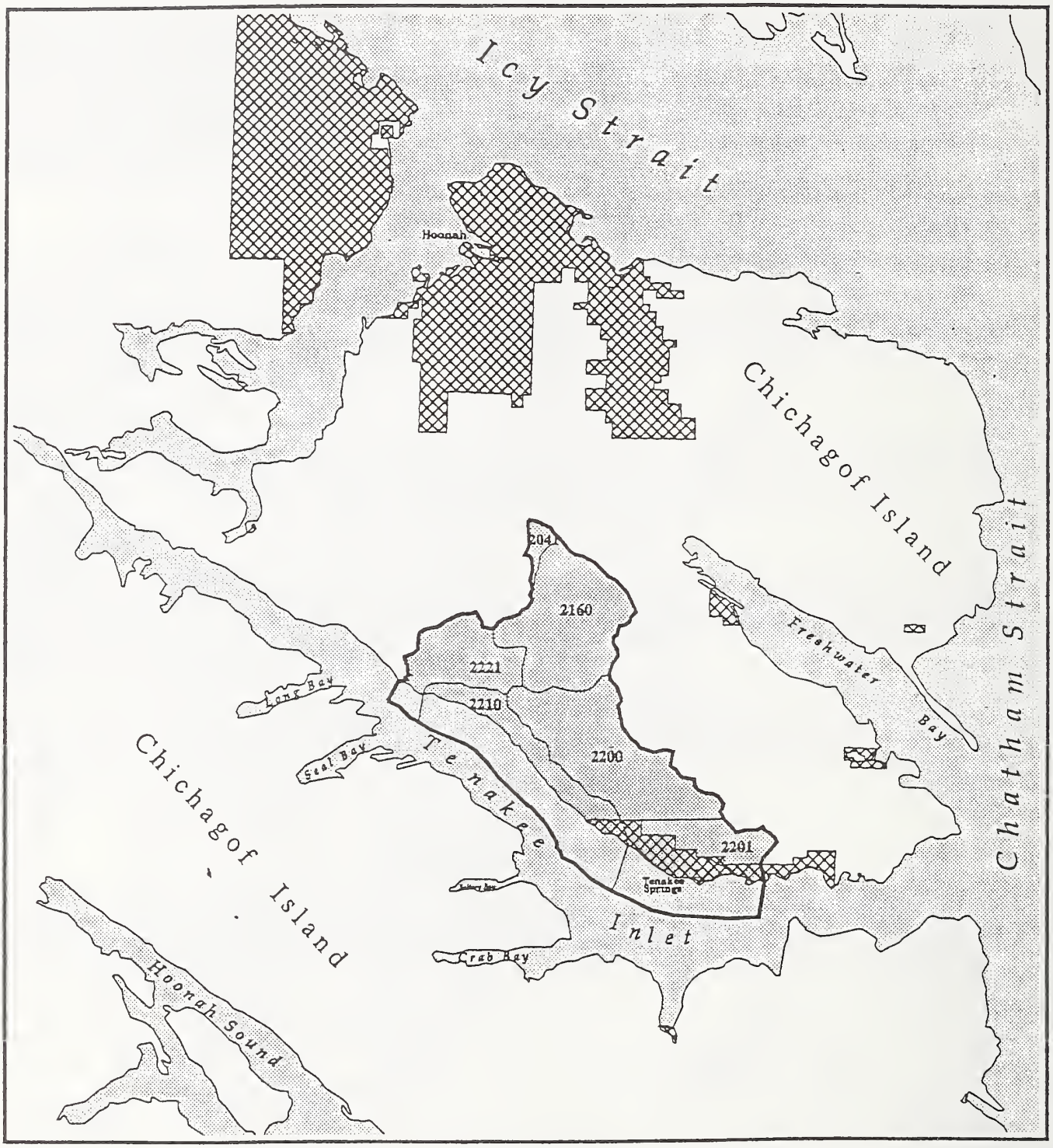

Icy Strait
Hoonah
Chichagof Island
Chatham Strait
2041
2160
2221
2210
2200
2201
Freshwater Bay
Tenakee Springs
Tenakee Inlet
Chichagof Island
Hoonah Sound
Crab Bay
Seal Bay
Other Ownership
Project Area
VCU Boundaries
2160 VCU Number
4 2 0 4 8
Scale in Miles
N
W
E
S

Table 1
Summary of Action Alternatives

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Sawlog Volume (mbf)	0	20,104	24,165	20,859	20,736	31,964
Sawlog & Utility Volume (mbf)	0	25,130	30,252	26,074	25,920	39,955
Proposed Harvest Acres	0	2,050	1,856	1,751	1,665	2,521
Number of Units	0	86	82	72	78	107
Proposed Harvest by Logging System						
Cable Acres	0	327	655	513	546	687
(percent)	0	(16)	(35)	(29)	(33)	(27)
Cable Volume (mbf)	0	5,543	12,611	10,221	10,384	13,858
		(22)	(42)	(40)	(40)	(35)
Cable/Helicopter Acres	0	63	121	58	89	121
(percent)	0	(3)	(7)	(3)	(5)	(5)
Cable/Helicopter Volume (mbf)	0	1,264	2,348	1,084	1,802	2,032
		(5)	(8)	(4)	(7)	(5)
Helicopter Acres	0	1,632	990	1,096	975	1,576
(percent)	0	(80)	(53)	(63)	(59)	(63)
Helicopter Volume (mbf)	0	17,941	13,602	13,116	12,597	21,413
		(71)	(45)	(50)	(49)	(53)
Shovel Acres	0	28	90	84	55	137
(percent)	0	(1)	(5)	(5)	(3)	(5)
Shovel Volume (mbf)	0	382	1,691	1,653	1,137	2,652
		(2)	(5)	(6)	(4)	(7)
Proposed Harvest Acres by Harvest Method						
Clearcut with Green Tree Retention	0	813	1,173	991	1,115	1,460
(percent)	0	(39)	(63)	(57)	(67)	(58)
Overstory Removal	0	325	186	151	159	244
(percent))	0	(16)	(10)	(9)	(10)	(10)
Patch Clearcut	0	118	167	120	85	493
(percent)	0	(6)	(9)	(7)	(5)	(19)
Group Selection	0	734	150	326	131	95
(percent)	0	(36)	(8)	(18)	(8)	(4)
Single Tree Selection	0	60	180	163	175	229
(percent)	0	(3)	(10)	(9)	(10)	(9)
Proposed Harvest Volume by Harvest Method (mbf)						
Clearcut with Green Tree Retention	0	16,710	24,446	20,491	21,497	29,946
Overstory Removal	0	4,141	2,435	1,905	2,177	4,048
Patch Clearcut	0	819	1,435	1,048	433	3,599
Group Selection	0	2,846	538	1,340	506	382
Single Tree Selection	0	614	1,398	1,290	1,307	1,980
Proposed Roads and Log Transfer Facilities (LTFs)						
New Road Miles	0	7.8	9.5	9.2	8.4	9.7
Reconstruction Miles	0	21.6	21.7	10.7	21.6	22.1
Temporary Road Miles	0	1.9	3.1	2.4	2.6	3.5
Number of LTFs	0	2	1	1	1	1

Source: G. Peterson 1996

Table 2
Threatened, Endangered, Species of Concern, and Sensitive Animal Species Which May Occur in the Indian River Project Area

Common Name	Scientific Name	Federal Status	Alaska Region Status
Humpback whale	*Megaptera novaengliae*	E	--
Steller sea lion	*Eumetopias jubatus*	T	--
American peregrine falcon	*Falco peregrinus anatum*	E	--
Marbled murrelet	*Brachyramphus marmoratus*	C	--
Harlequin duck	*Histrionicus histrionicus*	C	--
Northern goshawk	*Accipiter gentilis*	C	S
Olive-sided flycatcher	*Contopus borealis*	C	--
Osprey	*Pandion haliaetus*	--	S
Trumpeter swan	*Cygnus buccinator*	--	S
Peale's peregrine falcon	*Falco peregrinus pealei*	--	S

Source:

E = Endangered. Any species in danger of extinction throughout all or a significant portion of its range.

T = Threatened. Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

C = Species of Concern (former Category 2 Candidate species). Species for which there is information in the scientific literature indicating that populations or habitat may be decreasing significantly, but further evaluation is needed.

S = Sensitive species. Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: a.) significant current or predicted downward trends in population numbers or density, b.) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution (FSM 2670).

HUMPBACK WHALE

Distribution and Populations

The humpback whale is an endangered species. It occurs in all oceans of the world. In winter, most humpback whales occur in temperate and tropical waters of both hemispheres. In summer, most are in waters of high biological productivity, usually in the higher latitudes.

The humpback whale is the most abundant of the eight endangered species of whales that occur in Southeast Alaskan waters. Humpback whales are regularly sighted in the Inside Passage and coastal waters from Yakutat Bay south to Queen Charlotte Sound (NMFS 1991). They feed in Southeast Alaska from about May through December, although some have been seen every month of the year (Baker et al. 1985). Peak numbers of humpback whales are usually found in near-shore waters during late August and September, but substantial numbers usually remain until early winter. An estimated 300 to 350 humpback whales inhabit Southeast Alaska waters during the summer and fall (Baker et al. 1985).

The local distribution of humpback whales in Southeast Alaska appears to be correlated with the density and seasonal availability of prey, particularly herring and krill (Bryant et al. 1981, Baker et al. 1985). Important feeding areas in Southeast Alaska include Glacier Bay, Icy Strait, Stephens Passage, Frederick Sound, Seymour Canal, and Sitka Sound (Baker et al. 1985, Straley 1990).

Determination of Effects

The proposed activities that potentially could result in impacts to humpback whales are the use of camps, LTFs, and the movement of log rafts and barges.

Operation of LTFs and other docking facilities are restricted to small, very localized areas of the marine environment. Operation of LTFs is unlikely to affect prey availability for humpback whales. LTF permits require that remedial action be taken if monitoring determines that water quality has been impacted during construction and operation of LTFs. As a result, no impacts are anticipated to the marine environment which could affect humpback whale prey species.

Humpback whales could be disturbed by increased boat traffic associated with LTFs. Log barge towing occurs at relatively constant speeds and directions, and is less likely to elicit avoidance behavior from whales than other types of boating activity. Recreational boating by LTF workers involves frequent changes in speed and direction. Disturbance impacts would be localized and highly random, depending on many factors, such as the size of the bay, water depth, number of boats, and individual behavioral responses of humpback whales. Behavioral responses could include sounding, breaching, evasive underwater maneuvers, and maintaining distance. The likelihood of a boat collision with a humpback whale is remote and predicting such a random event would be difficult.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

AMERICAN PEREGRINE FALCON

Distribution and Populations

The American peregrine falcon is an endangered species. It nests in interior Alaska and occurs in Southeast Alaska on a short term basis during spring and fall migration. During migration, peregrine falcons forage in areas of high prey availability, such as seabird rookeries and waterfowl concentration areas (Armstrong 1990).

Determination of Effects

There are no seabird rookeries in the Project Area, but waterfowl may concentrate in estuaries within the Project Area. The American peregrine falcon would not be affected as a result of the proposed project since habitats used during migration (estuaries with concentrated waterfowl) would not be effected by the project.

Cumulative Effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

STELLER (NORTHERN) SEA LION

Distribution and Populations

The Steller sea lion is a threatened species. The range of the Steller sea lion extends along the rim of the North Pacific Ocean from eastern Asia, along the coast of Alaska, and south to California. The centers of abundance and distribution are the Gulf of Alaska and Aleutian Islands. Population levels have declined in portions of Alaska, but are fairly stable and may have even increased in Southeast Alaska (Zimmerman 1993). Steller sea lion critical habitat has been designated by the National Marine Fisheries Service (Zimmerman 1996); however, none of it is located in Tenakee Inlet.

Steller sea lion habitat includes marine and terrestrial areas that are used for a variety of purposes. Adult Steller sea lions congregate at rookeries for pupping and breeding. Rookeries generally are located on relatively remote islands, often in exposed areas where access by humans and mammalian predators is difficult. Steller sea lions eat a variety of fish and invertebrates. Potential prey items in marine waters of the Project Area include Pacific cod, Pacific herring, and salmon.

Determination of Effects

The proposed activities that potentially could result in impacts to Steller sea lions are the use of camps, LTFs, and the movement of log rafts and barges. Operation of LTFs and other docking facilities are restricted to small, very localized areas of the marine environment.

LTF operation is unlikely to affect prey availability for Steller sea lions because LTF permits require that remedial action be taken if monitoring determines that water quality has been impacted during construction and operation of LTFs.

Disruption of feeding activities may occur due to increased boating, recreation, aircraft, LTFs, and log barge towing in the area, but the frequency and effect of these interactions would be difficult to predict and is not expected to be significant. These activities may occasionally effect individuals but would not result in a negative effect on the species.

Cumulative Effects

There will be no measurable cumulative effects.

Findings

There will be no measurable effect to the species or their habitat.

HARLEQUIN DUCK

Distribution and Populations

The harlequin duck is a species of concern. The harlequin duck is a fairly common year-round resident in Southeast Alaska (Armstrong 1990). Harlequin ducks winter in coastal waters and nest along inland streams. Nests are well hidden and often difficult to locate. Nests have been found under root overhangs in creek banks, on cliff ledges above streams, on logjams, and in tree cavities (Cassirer and Groves 1991).

During winter, harlequin ducks are common to abundant in coastal waters of Southeast Alaska (Armstrong 1990). They winter close to reefs, rocky islands and cobble beaches, usually in small groups, but occasionally in rafts of several hundred or more.

Determination of Effects

Harlequin duck habitat is present in the Project Area. No surveys were conducted as timber harvesting activities would not occur within 100 feet of any stream which contains fish habitat. These streams represent the majority of potential harlequin duck habitat and therefore would not be affected.

Road crossings at streams may displace individuals, but the population would not be affected. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting Harlequin ducks are located.

Wintering habitat, which is found in coastal waters, also would not be affected as no proposed activities would occur in winter habitat areas.

Cumulative effects

There has been a loss of habitat due to past timber harvest which took place along streams of the Project Area. The proposed action would slightly add to this impact at stream road crossings. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain harlequin duck populations and habitat.

Findings

The project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

MARBLED MURRELET

Distribution and Populations

The marbled murrelet is currently listed as a species of concern. It occurs along the Pacific Coast of North America and Asia from south-central California to the Barren and Aleutian Islands in Alaska, and from the Sea of Okhotsk, Kamchatka, and the Commander Islands, south to Korea, Japan, and the Kurile Islands (Marshall 1988).

In Alaska, marbled murrelets are found along the coast from Southeast Alaska to the western Aleutian Islands. The highest numbers occur in Southeast Alaska where the population during the breeding season is estimated to be 96,000 marbled murrelets (Piatt and Ford 1993). This population comprises approximately 63 percent of the total estimated number of marbled murrelets in the entire state of Alaska.

Marbled murrelets forage year round in nearshore marine waters, congregating in well-defined areas where food is abundant. Marbled murrelets nest in old-growth forest habitat. Suitable nest trees have large branches, deformities, or other structures that provide a platform for a nest. Nests are generally located high above ground with good overhead protection. Most nests have been found in larger forest stands with sufficient interior forest habitat; these habitat conditions minimize the risk of predation at the nest and provide suitable climatic conditions for nesting (U.S. Fish and Wildlife Service 1994).

Marbled murrelets nest in old-growth forest habitat in the Project Area. All old-growth forest in the Project Area is adjacent to the marine environment where marbled murrelets occur, and therefore, is assumed to provide suitable nesting habitat for marbled murrelets.

No nesting activity has been documented in the Project Area (Mendenhall 1992) and no nesting surveys have been

conducted. However, nearshore marine surveys and dawn watches were conducted in the Project Area by Forest Service biologists.

Nearshore marine surveys were conducted in July of 1994 along the entire coast of the Project Area (approximately 58 km) according to established survey protocols (Ralph and Miller 1991). A total of 190 marbled murrelets were counted (Appendix B).

Two dawn watches were conducted in 1994 and 8 dawn watches occurred in 1995 according to established survey protocols (Paton, et al. 1990). A total of 691 marbled murrelets were counted (Appendix B).

Determination of Effects

Harvesting of old-growth timber in the Project Area is likely to result in loss of nesting habitat for marbled murrelets. Available evidence from Southeast Alaska suggests that marbled murrelets are dependent on old-growth forests for nesting habitat (Quinlan and Hughes 1990). Evidence from California, Oregon and Washington suggests that declines in murrelet populations may be related to the loss of mature and old-growth forest habitat (Carter and Morrison 1992).

All action alternatives would harvest stands which may be capable of providing nesting habitat for marbled murrelets. The amount of old-growth currently being used by marbled murrelets is unknown. The factors currently limiting marbled murrelets in Southeast Alaska have not been identified. Assuming that availability of nesting habitat is a limiting factor for the population, then a reduction in available nesting habitat could result in a reduction of the population. However, this relationship has not been quantified in Southeast Alaska.

Habitat fragmentation or increased edge would likely increase the estimated adverse effect of the action alternatives on marbled murrelets. Habitat fragmentation results in increased predation on nests of forest birds, and also allows for increased populations of predators. Corvids (i.e., crows, ravens, and jays) are edge species that would increase in numbers as edge increases. Marbled murrelet nests are highly susceptible to predation, primarily by corvids (Nelson 1993). Thus, it follows that habitat fragmentation has an effect on marbled murrelet nesting success. The size of old-growth forest patches is also important because marbled murrelets nest in loose colonies or aggregations.

A strategy for maintaining viable populations of old growth dependent species was developed which deferred areas from timber harvest. Figure 2 displays proposed Habitat Conservation Areas (HCA). The proposed large and medium-sized HCAs within the project boundary, have been deferred from harvest this entry. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting marbled murrelets are located. With these reserves in place it is believed that, although individuals may be affected, this project would not result in a trend toward federal listing of marbled murrelets.

Cumulative effects

Approximately 11 percent of the old growth (8000 board feet per acre or greater) acres existing in 1956 have been removed during previous harvest. This project could remove an additional 9 percent of the existing old growth habitat acreage. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain viable marbled murrelet populations and habitat.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

NORTHERN GOSHAWK

Distribution and Populations

The northern goshawk is a species of concern and is also identified as a sensitive species by the Alaska Region of the Forest Service. It occurs in forested regions throughout the higher latitudes of the northern hemisphere. The species is uncommon in Southeast Alaska (Armstrong 1990).

The northern goshawk nests in old-growth forest habitat in Southeast Alaska. Suitable nesting habitat consists of forest stands at least 20 to 30 acres in size, with large trees, closed canopy, and low understory vegetation (USDA Forest Service 1991). These structural characteristics are important for providing nest and perch sites, for facilitating flight beneath the canopy and between trees, and perhaps for providing prey species habitat (Crocker-Bedford 1993).

Surveys Conducted

In an effort to avoid timber harvest near goshawk nesting sites, Forest Service biologists conducted surveys of proposed timber harvest units and road locations according to established protocols (Forest Service 1992). Surveys were conducted in 1994, 1995, and 1996 (Appendix C). Goshawk surveys were initiated based on probability of nesting habitat, previous goshawk observations, and areas not previously surveyed. The surveys were then prioritized based on probability of nesting habitat. Probability was determined based on attributes of known nest sites in Southeast Alaska. Attributes included areas below 1000 feet elevation, timber volume class greater than 8000 board feet/acre, slopes less than 75%, with landforms of broken mountainslope or hillslope, hills, footslope, or valley bottom.

A goshawk was seen in the 10-Mile Creek drainage in 1993 and 1994 (pers. comm., P. Mooney). In 1995, a plucking post, two inactive nest sites, and a possible goshawk response to recorded calls was documented in the vicinity of units 6041, 6042, and 6061. Also in 1995, a nest with two adult raptors identified as goshawks or red-tailed hawks was located west of the 7500 road, approximately 0.5 mile south of the intersection with the 7502 road. Additional surveys need to be made in these areas to determine if there are active nests. If an active nest site is located, standards and guidelines, policy, and contract clauses are adequate to insure protection of the site and nesting birds.

Determination of Effects

Up to 9 percent of the remaining old growth (8000 board feet per acre or greater) acreage would be removed from the Project Area.

Based on three years of intensive surveys, there is high confidence that timber harvest will not remove any active nest trees. There will be a reduction in the number of potential nest trees and a decrease in the amount of forage area for goshawks.

Other impacts of timber harvest may include fragmentation, reduced foraging habitat quality, reduced prey densities, and increased competition from red-tailed hawks and other raptors (Crocker-Bedford 1990).

A strategy for maintaining viable populations of old growth dependent species was developed which deferred areas from timber harvest. Figure 3 displays proposed Old Growth Reserves (OGR). The proposed large and medium-sized OGRs within the project boundary, have been deferred from harvest in this project. With these reserves in place it is believed that, although individuals may be affected, this project would not result in a trend toward federal listing of northern goshawks. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting northern goshawks are located.

Cumulative effects

Approximately 11 percent of the old growth (8000 board feet per acre or greater) acres existing in 1956 have been removed during previous harvest. This project could remove an additional 9 percent of the existing old growth habitat acreage. There will be future timber sales planned in the Project Area; however, current standards and guidelines, policy and direction, and legal requirements are adequate to maintain viable northern goshawk populations and habitat.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

OLIVE-SIDED FLYCATCHER

Distribution and Populations

The olive-sided flycatcher is a species of concern. It is uncommon in Southeast Alaska (Armstrong 1990). This species nests in a variety of habitats including coniferous forest, open woodland, and muskegs. In Southeast Alaska, this species occurs primarily in second-growth forest and alder habitats, and occasionally in muskegs.

Determination of Effects

Short-term loss of habitat and displacement of individuals would occur from construction of roads through muskegs and clearing of alder from existing roads. In the long term, timber harvest would increase the amount of second growth, alder, and edge habitats. Impacts to the olive-sided flycatcher may be beneficial in the long term.

Cumulative effects

There will be no measurable adverse cumulative effects.

Findings

This project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

OSPREY

Distribution and Populations

The osprey is identified as a sensitive species by the Alaska Region of the Forest Service. Ospreys are rare in Southeast Alaska (Armstrong 1990) and the only known nest sites in Southeast Alaska are located in the Stikine Area (USDA Forest Service 1991). There have been no reported observations in the Project Area. Because of this limited distribution in Southeast Alaska, ospreys are not expected to occur in the Project Area.

Determination of Effects

Ospreys would not be affected by the proposed action as this species is unlikely to occur in the Project Area.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

PEALE'S PEREGRINE FALCON

Distribution and Populations

The Peale's peregrine falcon is identified as a sensitive species by the Alaska Region of the Forest Service. They nest along the outer coast of the Gulf of Alaska. Nests are generally associated with large seabird colonies (USDA Forest Service 1991). The Project Area is not located along the outer coast, and there are no seabird colonies in the Project Area; therefore, Peale's peregrine falcons are not expected to occur in the Project Area.

Determination of Effects

Peale's peregrine falcon would not be affected by the proposed action as this species is unlikely to occur in the Project Area.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

TRUMPETER SWAN

Distribution and Populations

The trumpeter swan is identified as a sensitive species by the Alaska Region of the Forest Service. They are known to nest at Yakutat and in the Chilkat Valley in Southeast Alaska. Trumpeter swans from other parts of Alaska migrate through and winter in Southeast Alaska. They are considered rare in Southeast Alaska in winter, except in Blind Slough near Petersburg (Armstrong 1990). They may use pond habitats (Armstrong 1990) in the Project Area but it is unlikely

that they would overwinter because the ponds in the Project Area are small in size and number and usually freeze in the winter.

Determination of Effects

Individual trumpeter swans occurring in the Project Area could be temporarily disturbed by human activities associated with timber harvesting and road construction. Appropriate contract clauses (such as C6.01 - Interruption or Delay of Operations) will be implemented if nesting trumpeter swans are located. No other measurable impacts are expected to occur from the proposed action.

Cumulative effects

There will be no measurable cumulative effects.

Findings

There will be no measurable impact on the species or their habitat.

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BIOLOGICAL EVALUATION FOR PLANTS

Indian River Timber Sale Area

Hoonah and Sitka Ranger Districts
Tongass National Forest

Prepared by: Susan J. Trull
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Date: 9/24/96

BIOLOGICAL EVALUATION FOR PLANTS
Indian River Timber Sale Area
Hoonah and Sitka Ranger Districts, Tongass National Forest

INTRODUCTION

The Indian River Timber Sale consists of proposed timber harvest units, haul roads, log transfer facilities, and related activities on the southern part of the northeastern peninsula of Chichagof Island. The Project Area formerly was part of the Alaska Pulp Company long-term timber sale contract area, but is now being considered under the independent sale program of the Chatham Area. Details of the project, six proposed alternatives, potential effects, and maps are given in the Draft Environmental Impact Statement (DEIS; USDA FS in prep.).

The purpose of a Biological Evaluation (BE) is to analyze the possible effects of the proposed activities on threatened, endangered, proposed, and sensitive plants.

PROJECT DESCRIPTION

The alternatives range from no action to a maximum of 2,517 harvest acres, 9.7 miles of new roads, and 22.1 miles of reconstructed existing roads. Timber harvest is proposed to include several harvest systems, such as helicopter, cable, and shovel yarding. Proposed harvest types include clearcuts with reserves, patch clearcuts, group selection, shelterwood, individual tree mark, and overstory removal. See the DEIS for a summary of proposed actions by alternative.

SENSITIVE PLANTS

The only plant federally listed or proposed by the U.S. Fish and Wildlife Service in Alaska is *Polystichum aleuticum*, which is endangered. It is only known from Adak Island and is not expected to occur in the Project Area.

Twenty-two vascular plants are designated as sensitive in the Alaska Region (Appendix A). Sensitive plants known or suspected to occur on the Hoonah and Sitka Ranger Districts of the Tongass National Forest are shown in Table 1. Two plants are designated Species of Concern by the US Fish and Wildlife Service. Species of Concern are those taxa for which the Service has available scientific information which indicates populations may be declining or facing threats. These were formerly called Category 2 Candidate Species (US Fish and Wildlife Service 1996).

Table 1. Sensitive Plants Known or Suspected to Occur on Hoonah and Sitka RDs (Stensvold 1995)

Norberg arnica (*Arnica lessingii* ssp. *norbergii*)	suspected
Goose-grass sedge (*Carex lenticularis* var. *dolia*)†	known
Pretty shooting star (*Dodecatheon pulchellum* ssp. *alaskanum*)	known
Northern rockcress (*Draba borealis* var. *maxima*)	suspected
Kamchatka rockcress (*Draba kamtschatica*)	suspected
Davy mannagrass (*Glyceria leptostachya*)	suspected
Wright filmy fern (*Hymenophyllum wrightii*)	known
Truncate quillwort (*Isoetes truncata*)	suspected
Calder lovage (*Ligusticum calderi*)	suspected
Choris bog orchid (*Platanthera chorisiana*)	known
Bog orchid (*Platanthera gracilis*)	suspected
Loose-flowered bluegrass (*Poa laxiflora*)	known
Kamchatka alkali grass (*Puccinellia kamtschatica*)	suspected
Unalaska mist-maid (*Romanzoffia unalaschcensis*)	known
Queen Charlotte butterweed (*Senecio moresbiensis*)	suspected
Circumpolar starwort (*Stellaria ruscifolia* ssp. *aleutica*)	suspected
Smooth-fruited netleaf willow (*Salix reticulata* ssp. *glabellicarpa*)*	suspected
Ascending moonwort (*Botrychium ascendens*)*†	suspected

*Likely to be added to the Region 10 Sensitive Species list
† US Fish and Wildlife Service Species of Concern

PRE-FIELD REVIEW OF EXISTING INFORMATION

A pre-field review of existing information concerning the plants listed above was conducted for the Project Area. This review included the Regional Forester's Sensitive Species List; Alaska Natural Heritage Program (AKNHP) database records; Chatham Area Integrated Resource Inventory database; botanical literature (titles are listed in the references section of this report); and consultation with Mary Stensvold, the Alaska Region Botanist. Proposed and existing road and unit locations, aerial photographs, and the common land unit layer (mapping polygons based on landform, slope, geology, soils, and vegetation) of the Chatham Area Geographic Information System (GIS) were also reviewed.

PLANTS KNOWN

Previously documented sightings of sensitive plants in or near the Project Area are shown in Table 2.

Table 2. Documented Sensitive Plant Sightings near the Project Area (Stensvold 1995; USDA FS field recon. 1995, 1996)

Taxon	Location	Approx. Minimum Distance to Project Area
Carex lenticularis var. *dolia*	Hoonah Ranger District	not available (not in Project Area)
Dodecatheon pulchellum ssp. *alaskanum*	Hoonah	12 miles
Platanthera chorisiana	W. side Lisianski Inlet, Chichagof Island	25 miles
	Tonalite Creek, Chichagof Island	10 miles
	Indian River, Chichagof Island	in Project Area
	Tough Choice Creek, Chichagof Island	10 miles
Poa laxiflora	Hoonah main street	12 miles

PLANTS SUSPECTED. The following general habitats (or plant communities) occur in the Project Area: open and closed coniferous forest (various plant associations including western hemlock series, Sitka spruce series, mixed conifer series, western hemlock-yellowcedar series, mountain hemlock series), deciduous forest (red alder), forest edge, rocky areas, rock outcrops, ridgetops, cliffs, calcareous areas, gravel, scree, seeps, swales, riparian areas, stream banks, waterfalls, lake margins, ponds, shallow freshwater, sphagnum bogs, fens, heath, subalpine meadows, alpine, area dominated by moss or lichen, moist-wet meadows, upper beach meadows, maritime beaches.

The sensitive plants listed below are suspected to occur in the Project Area since the area contains appropriate habitats and is within the known or suspected range of the plants:.

Arnica lessingii ssp. *norbergii*

Norberg Arnica generally occurs in open forest, heath, dry and wet meadows, and alpine and subalpine habitats. According to Hulten (1968), it may be only a local variation of *Arnica lessingii lessingii*. It is known from several widely scattered locations across southeastern, southwestern, and southcentral Alaska.

Carex lenticularis var. *dolia*

Goose-grass sedge generally occurs in lake margins, marshy areas, heath, wet meadows, and alpine and subalpine habitats. It is known from several collections in southeast and southcentral Alaska and the Aleutian Islands. It is a Fish and Wildlife Service Species of Concern.

Dodecatheon pulchellum ssp. *alaskanum*

Pretty shooting star generally occurs in upper beach meadows, wet meadows, and alpine and subalpine habitats. Six collections have been verified statewide, limited to southcentral and southeast Alaska. The taxon is a coastal polyploid race according to Hitchcock et al. (1955), and is difficult to distinguish from *Dodecatheon pulchellum* ssp. *superbum*. The taxonomic validity of the plant is questioned.

Draba borealis var. *maxima*

Northern rockcress generally occurs in alpine tundra, heath, open woods, and rock outcrops. Nine

collections are known for the state, where it is limited to Kodiak, southcentral, and northern southeast Alaska.

Draba kamtschatica
Kamchatka rockcress generally occurs in alpine and subalpine habitats. Four occurrences are documented in Alaska, where the plant is apparently limited to southcentral and southeast Alaska, the Seward Peninsula and the Aleutians.

Glyceria leptostachya
Davy mannagrass generally occurs in streamsides, riverbanks, lake margins, marshy areas, and shallow freshwater. Two occurrences are documented for the state, where the plant is apparently limited to central and southern southeast Alaska.

Hymenophyllum wrightii
Wright filmy fern generally occurs in forest and forest edge habitats, particularly on tree trunks and rocks in humid, damp woods. Three occurrences are documented for Alaska, all in southeast, and all as gametophytes.

Isoetes truncata
Truncate quillwort generally occurs in shallow freshwater. State known occurrences are limited to southeast and southcentral Alaska. The plant's identity to the species level can only be confirmed in October, when the megaspores necessary for identification are mature.

Ligusticum calderi
Calder lovage generally occurs in forest edge, subalpine and alpine habitats, and on rock outcrops. The three documented Alaska occurrences are limited to southcentral and southeast Alaska.

Platanthera chorisiana
Choris bog orchid generally occurs in muskegs and heaths. Several occurrences are known for the state, in the Aleutians and southern coastal Alaska. Several additional populations were found during the 1995 and 1996 field seasons. This plant may be removed from the sensitive plant list in the future, as it appears to be more common than previously thought.

Platanthera gracilis
Slender bog orchid generally occurs in upper beach meadows, muskeg, heath, and wet meadows. Taxonomy of this plant is questioned, as some authors have subsumed the plant into *Platanthera saccata*. Four occurrences are known for the state, in southernmost southeast Alaska.

Poa laxiflora
Loose-flowered bluegrass generally occurs in upper beach meadows, open forest, and wet meadows. There are several occurrences in the state, limited to southeast Alaska.

Puccinellia kamtschatica
Kamchatka alkali grass generally occurs in maritime beaches and upper beach meadows. The taxonomy of the plant is questioned, as some authorities do not recognize this species as distinct from *Puccinellia nutkaensis*. Four occurrences are documented for the state, where the plant is apparently limited to southcentral and southeast Alaska, the Alaska Peninsula, and the Aleutian Islands.

Romanzoffia unalaschcensis
Unalaska mist-maid generally occurs in forest edges, streamsides, riverbanks, and rock outcrops. Several locations are known in the state, where the plant is apparently restricted to the eastern Aleutians, Alaska Peninsula, Kodiak and southeast Alaska.

Senecio moresbiensis
Queen Charlotte butterweed generally occurs in heath, dry and wet meadows, and alpine/subalpine habitats. Five occurrences are known for the state, limited to southern southeast Alaska.

Stellaria ruscifolia ssp. *aleutica*
Circumpolar starwort generally occurs in streamsides, riverbanks, alpine/subalpine habitats, and rock outcrops. Ten occurrences are known for the state, in southeastern, southcentral, and the Aleutians.

Botrychium ascendens
Ascending moonwort generally occurs in upper beach meadows, well drained open areas, and dry meadows. It is a relatively newly described taxon, previously collected from Yakutat and found there in 1996. While it is a Fish and Wildlife Service Species of Concern, it is not currently on the Region 10 Sensitive Species List, but is likely to be added in the future.

Salix reticulata ssp. *glabellicarpa*
Smooth-fruited netleaf willow generally occurs in alpine and subalpine areas. One population is known statewide, from Juneau. Other populations are limited to the Queen Charlotte Islands. It is not currently on the Region 10 Sensitive Species List, but is likely to be added in the future.

FIELD SURVEYS FOR SENSITIVE PLANTS

Since sensitive plants could potentially occur in the Project Area, and be affected by the proposed project (except the no action alternative), field surveys were conducted. Due to budget, personnel, and time restrictions, all areas proposed for action under any of the five action alternatives could not be surveyed. In 1995, the Hoonah Ranger District Wildlife Biologist selected four areas for survey, based on vegetation and her experience in the area. No further information is available as to her selection method. In 1996, a risk model was used to stratify the Project Area so that surveys could be conducted in the habitats most likely to support sensitive plants. The following paragraphs describe the 1996 ranking methodology:

A tentative probability of sensitive plant occurrence was assigned using a risk model based on the common land unit (CLU) layer in the Chatham Area GIS. This CLU layer is derived from field work and aerial photograph review and assigns codes based on landform, geology, slope, soils, and vegetation to polygons across the Chatham Area. These polygons were correlated to the "preferred" habitat of sensitive plants, as developed from floras, plant collections, and experience by Forest Service ecologists and the Alaska Region Botanist (these habitats are listed above for each species). The correlation is not precise, and, in some cases, use of the correlation overestimates or underestimates the available habitat. Preferred habitats were mapped for each VCU, and the proposed timber harvest units and roads were overlaid. Details of this model are given in Appendix B.

Proposed timber harvest units intersecting preferred habitats were given a priority rating depending on overlap type and extent. Habitat boundaries are usually gradual rather than abrupt, which complicates delineation. Since the CLU polygons and the unit boundaries were drawn on different photograph sets, by different people, with differing pencil widths, typically there are "slivers" along unit boundaries. For example, the map may show an intersection of a proposed timber unit with muskeg. However, on the ground, the timber unit would not include the muskeg since it is not commercial forest land. Thus, discrepancies occur between the actual habitat boundaries and where they show on the map.

Units with these "slivers" along their boundaries were given a priority level of 1, as were units with no intersection with a preferred habitat. Lack of intersection with a preferred habitat **does not mean** sensitive plants could not occur in the unit, but that the occurrence is less likely.

Units with a larger intersection of preferred habitat were given a priority level of 2, 3, or 4, depending on the amount of intersection and the type of habitat intersected. Because more of the sensitive species "prefer" alpine/subalpine habitats, this category was given greater priority. Units with a significant intersection with alpine/subalpine habitats were given a priority level of 4. Those with a minor intersection with alpine/subalpine, or a significant intersection with a preferred habitat other than alpine/subalpine, were assigned priority level 3. Units with a minor intersection with a preferred habitat other than alpine/subalpine were assigned priority level 2. "Significant" and "minor" intersections were determined subjectively by the Forest Ecologist.

Proposed road segments were similarly assessed for survey priority, with priorities based on the amount and type of habitat crossed by the road corridor.

Subsequent to this analysis, aerial photographs were examined for each proposed unit and new road location. Priorities were confirmed or changed based on the photograph review. "Low probability habitat for sensitive plants" was assigned to units and road segments with zero or minor (e.g. sliver) overlap with preferred habitat. These were generally areas previously ranked "1", unless the photograph showed a significant overlap with preferred habitat that had not shown on the GIS maps. However, several areas initially ranked with a higher probability based on the CLU mapping were reassigned to this category when the photograph examination showed that the CLU-predicted habitat probably was not actually present (due to mapping errors, inaccuracy of the correlation, and slivering).

"Low" or "moderate" survey priority was assigned to units and road segments showing on the photographs to indeed have more than a minor overlap with a preferred habitat. Low survey priority was assigned to areas showing smaller overlaps with preferred habitats, particularly non-alpine areas, and appearing to have relatively homogenous vegetation. Moderate survey priority was assigned to areas with larger overlaps with preferred habitat, particularly alpine and muskeg. These were generally areas previously ranked 2 and 3. High survey priority was assigned to a few locations showing significant overlap with alpine areas and unusual vegetation or multiple vegetation types in a small area. These were generally areas previously ranked 4. Each of the low, moderate, and high survey priority areas was included in the pool for field surveys as time permitted.

Probability and priority rankings are shown on the Road and Unit Cards in the DEIS and are summarized in Table 3.

Many timber harvest units were found to lie primarily outside preferred habitats, which is not surprising since most of the Alaska Region sensitive plants prefer nonforest communities, and the timber units are placed in productive forest. Some units, however, and several proposed roads, however, cross preferred habitats.

The GIS maps used in the initial stratification are filed in the Project Planning Record. Aerial photographs and mylar overlays showing road and unit proposed locations are filed with the Planning Team.

Table 3. Proposed units and roads survey rankings
(All units/roads not listed are ranked as low probability habitat for sensitive plants)

Unit	Ranking*
1610	high survey priority
2220	low survey priority
2710	moderate survey priority
3020	moderate survey priority
3212	moderate survey priority
3222	moderate survey priority
3610	moderate survey priority
4440	low survey priority
4450	low survey priority
4910	moderate survey priority
5020	low survey priority
5080	low survey priority
5220	low survey priority
8000	high survey priority
20510	high survey priority
20710	high survey priority
20810	high survey priority
20910	low survey priority
61020	moderate survey priority
62510	moderate survey priority
63510	moderate survey priority
63520	moderate survey priority
64210	low survey priority
65020	moderate survey priority
Roads	
7508 road (near units 64010, 63940 etc.)	high survey priority (95; low 96)
7502 road (10-mile LTF)	high survey priority (95)
7500 road (top, near unit 62710, 62720)	high survey priority (95)
75007 road (to unit 61410 etc.)	high survey priority (95, 96)
750071 road (near 65010)	high survey priority
Temp road to unit 64410	moderate survey priority
Temp road to unit 2710 (dropped)	moderate survey priority
Temp road to unit 64210 (dropped)	low survey priority
Temp road to unit 63510	low survey priority

*1996 unless otherwise noted

Field surveys were scheduled to cover as many of the high, moderate, and low survey priority proposed roads and units as possible, within the constraints of budget, personnel, time available, safety, helicopter or other access, and proximity to other areas scheduled for a survey. Surveys were conducted in 1995 by Biological Technician Mary Dalton (with botanical experience), and two summer volunteers, trained for the purpose. Surveys were conducted in 1996 by Ecologist Michael Shephard (with botanical experience) and Regional Ecologist Greg Nowacki. Both crew leaders had completed sensitive plant training with the Regional Botanist.

Surveys were conducted 7/13 - 7/16, 1995 and 7/10 - 7/16, 1996. Surveys along proposed road corridors were generally of level 4 or 5 intensity (see Appendix C for survey intensity levels). Unit surveys were conducted at level 2 or 3 since usually only the portion of the unit falling in a preferred habitat was surveyed. Thus the survey intensity was greater for the preferred habitat (e.g., level 4 or 5), but is classified as a lower intensity for the unit as a whole.

During each survey, data were collected on species composition, site characteristics such as landform, elevation, aspect, slope, landscape position, plant community, and the type of sensitive species habitat surveyed. Data were collected along a survey route each time there was a major vegetation change, such as a change from forest to muskeg, or from western hemlock forest to mixed conifer forest. The survey protocol and a sample data sheet are shown in Appendix D. When sensitive plants were found, additional

data were collected, the plants usually photographed, and, if the population was large enough, a voucher specimen collected. This process follows the Region 10 Sensitive Plant Survey and Sighting guidelines prepared by the Regional Botanist. Sighting forms are forwarded to the Regional Botanist who sends the data on to the Alaska Natural Heritage Program.

Following each survey or survey group, a summary form (the Daily Sensitive Plant Survey Form) was completed, listing time spent on the survey, travel, and plant identification; distance surveyed; sensitive plants found; whether the survey was conducted at the appropriate time of year; and whether additional surveys were needed. The completion protocol and a sample form are shown in Appendix D. The daily plant survey forms, along with the field data sheets, are filed with the Forest Ecologist at the Chatham Area Supervisor's Office. Data were entered into EXCEL spreadsheet files; these files are archived with the Forest Ecologist. See Appendix E for copies of data.

The filmy fern, *Hymenophyllum wrightii,* was not given the same level of scrutiny as the other plants, because the gametophyte (the only known stage in Alaska) is minute. It is several millimeters long, one cell thick, 10-15 cells wide, similar in appearance to mosses, and therefore extremely difficult to find. Likely habitats were examined, but the fern could easily have been missed even if it did occur in the Project Area.

FIELD SURVEY RESULTS

Four surveys were conducted in 1995, and 12 in 1996, including areas in each of the VCUs proposed for action. One species of R10 sensitive plants was found in several locations: *Platanthera chorisiana*, choris bog orchid. Photographs were taken of the plant, and are filed with the Forest Ecologist. Voucher specimens were collected and are filed with the Regional Botanist.

Survey results are summarized in Table 4. Survey general data, site data, and vegetation data are shown in Appendix E. Survey routes are recorded on mylar overlays to aerial photographs, and are filed with the Forest Ecologist.

Table 4. Survey results for *Platanthera chorisiana* sightings

	Approx. population size	Status
Found outside proposed unit 2710	~2+	No action proposed for this area
Found within proposed units 62510	~15	Unit dropped from pool
63510	~10	Unit possibly can be modified to avoid (clearcut with reserves)
Found along proposed roads 75007	~100+ (95) ~45+ (96)	Road moved once to avoid 1995 site with 100+ (96 survey followed new, flagged route); probably cannot be moved further; therefore some orchids will be avoided and others not; indirect impacts (e.g. hydrologic change) may occur to populations near but not in road corridor
7508	~6	Possibly move initial bend in road higher and decrease impacts
Temp road to unit 64410	~10	Possibly can flag and avoid area

Platanthera chorisiana is currently on the R10 sensitive list and is proposed in the 1996 draft Tongass Land Management Plan to remain on the list. However, the Regional Botanist is considering removing this plant from the sensitive plant list (M. Stensvold, pers. comm. 9/96). *Platanthera chorisiana* is ranked G2G3 under the Natural Heritage Program ranking system, meaning the taxon is imperiled globally (G2) or the

taxon is either very rare and local throughout its range or found locally in a restricted range (G3). Surveys conducted in 1995 found this orchid at two additional locations on the Chatham Area, and at several sites on the Ketchikan Area.

The proposed 10-mile LTF site was surveyed in 1995. One clump of *Puccinellia* species, alkali grass, was found at the proposed site. A specimen was collected for verification. It is unlikely to be *P. kamschatica*, according to Regional Botanist Mary Stensvold (pers. comm. 7/95). *P. kamschatica* is a questionable taxon, and is not proposed to remain on the sensitive plant list in the 1996 draft Tongass Land Management Plan.

The surveys took place at the appropriate time of year to identify sensitive plants. No sensitive plants were found in stages which could not be identified.

DETERMINATION OF EFFECTS

Since not all areas were surveyed, habitat disturbance potential is high, and sensitive plants were found, a risk assessment is warranted (FSM 2672.43). This assessment considers risks to the known populations of *Platanthera chorisiana* as well as risks to other sensitive plants that may occur in the Project Area, since surveys could not cover the entire area.

Determination of risks to populations of sensitive plants takes into account: size, density, vigor, habitat requirements, location of the populations, and consequences of adverse effects on the taxa as a whole within their range and within the National Forest.

Direct Effects

Aspects of this project that may have negative effects on sensitive plants or their habitat under the action alternatives are:

-destruction of plants and loss of habitat in road corridors due to trampling by workers, machinery, and deposition of road materials;

-destruction of plants in timber harvest units due to trampling by workers, trees falling on the plants, trees dragged/raised over the plants as the trunks are moved off-site, or slash deposited on the plants;

-death of plants growing on trees that are harvested;

-loss of habitat and death of plants growing in shallow freshwater (such as muskeg ponds) filled in by road construction;

-loss of habitat and destruction of plants growing in LTF sites due to trampling by workers and machinery, deposition of road materials or timber, washing up of "escaped" logs onto beach habitats;

-destruction of plants growing in areas used as helicopter access points to timber units, due to trampling by workers or helicopter landings.

These impacts are common to the five action alternatives, but the extent would vary by alternative. Alternative F would have the greatest impact on habitats since the proposed timber harvest acreage and extent of new road construction and road reconstruction are the largest under this alternative. The no action alternative (A) would not affect sensitive plants or their habitats.

Indirect Effects

Previously unknown populations of sensitive plants adjacent to and in the vicinity of the Project Area could be affected by implementation of any of the action alternatives. For example, sensitive plants could be indirectly, but adversely, affected by activities resulting in changes in hydrology, such as changes due to road building. Roaded and harvested areas may be more prone to soil erosion and landslides, depending

on site conditions, which could destroy sensitive plants or habitat.

Activities may indirectly affect sensitive plant populations and habitat through the introduction of exotic plants, which compete with native plants for available habitats.

Proposed activities may also affect sensitive plant populations by opening the canopy of previously forested areas, which frequently results in plant composition changes, and changes the amount of available habitat for forest species such as *Hymenophyllum wrightii.*

Deer populations may decrease under the action alternatives, which could reduce foraging on sensitive plants.

The action alternatives (B-F) would provide more roads into the area, probably increasing recreation (e.g., off-road vehicle use) and hunting use of the area, which may affect sensitive plants through trampling or changes in plant composition and hydrology. For example, ATVs ridden across muskegs often destroy the vegetation and soil structure, resulting in a mucky ditch replacing plant habitat.

Cumulative Effects

Effects on plant populations are cumulative over time, thus possible effects of the five action alternatives are cumulative with historical, present, and future uses of the Project Area. Previously constructed roads and clear cuts have increased the acreage of red alder, Sitka alder, willow, and black cottonwood in the Project Area, while previously harvested areas have decreased the acreage of late seral forest and increased the acreage of second growth. For the most part, cyclical changes in forest habitat from late seral to young second growth with harvest of timber do not affect sensitive species since the Alaska Region sensitive plants mainly prefer nonforest habitats. It is likely, however, that past road construction has degraded potential sensitive plant habitat.

Since the 1940s, the Project Area is estimated to have emerged, relative to sea level, between approximately 1.0 and 1.3 cm/yr (Hicks and Shofnos, 1965). This emergence is mainly due to isostatic rebound following the retreat of glaciers. Land emergence changes habitat availability. For example, as the land rises relative to sea level, new areas become available for colonization by beach plants. Former beaches are gradually colonized by upland plant species and may develop into forest. Over a longer time scale, the Project Area is located on a geologic block estimated to have been uplifted vertically 2 to 6 km since about 25 million years ago (Brew, 1988).

Island biogeographic principles have also affected plant composition in the Project Area: following glacial retreat, Chichagof Island had to be recolonized by plants from glacial refugia, either land masses not glaciated, or nunataks, peaks remaining ice-free while surrounded by icefields (Heusser, 1954; Pielou, 1991). The rate of recolonization will vary with distance from the refugium, so it is likely that plant distribution varies between the islands of southeast Alaska. Information on plant species distribution among the islands is lacking, but animal data show that there are differences among the islands. For example, brown bears occur on Admiralty, Baranof, and Chichagof Islands, but not currently on Prince of Wales Island.

Avalanches in the Project Area also affect plant habitats, by periodically setting back succession and often resulting in permanent shrubfields in the higher elevations.

Human uses can also impact sensitive plants, but since none of the Alaska Region sensitive plants are primary food or medicinal species, subsistence use is unlikely to affect populations significantly.

Plant succession is ongoing in the Project Area, and may convert forest to muskeg, landslide areas to shrublands, etc. All these community changes affect the availability of habitats for sensitive plants.

The proposed actions may exacerbate or ameliorate ongoing changes in the Project Area. Continued uplift may lead to new beach areas, while beach areas are damaged with development of LTFs. Sensitive species are uncommon and thus typically slower to invade new habitats.

Other cumulative effects in the Project Area are due to road construction, associated rockpits, debris, herbicide use, seeding with exotics, glacial advance or retreat and past logging. Future logging in the area, reconstruction of roads, and related activities will also affect sensitive plant habitats in the Project Area.

Mitigation Measures in the Alternatives

The order of priority for mitigation is: 1) avoid the impact, 2) minimize the impact, 3) rectify the impact, 4) reduce or eliminate the impact over time, and 5) compensate for the impact (FSM 1909.15 and 40 CFR 1508.20).

Mitigation measures to be included in the five action alternatives are recommended by each resource specialist, and include such measures as following best management practices (BMPs) for soil and water conservation, providing riparian conservation areas along certain streams, and following forest-wide standards and guidelines. Following the BMPs will reduce likelihood of soil erosion, which will mitigate possible loss of plant habitats. Riparian buffers will protect sensitive plants that may occur in riparian areas. Wildlife habitat mitigation includes avoidance of activities in beach and estuary fringes, which also protects the sensitive plants that prefer these habitats (e.g., *Puccinellia, Dodecatheon, Botrychium*).

Specific mitigation recommendations for different resources such as timber, soils, wildlife, are listed on the road and unit cards in the DEIS. Sensitive plant mitigation recommendations include the following:

1) Concentrate the timber harvest in unit 63510 away from the swales where *Platanthera chorisiana* is found (if need be, have a botanist/plant ecologist present during layout of this unit);

2) Drop unit 62510 from the unit pool this entry;

3) A botanist/plant ecologist shall flag the *Platanthera chorisiana* population(s) near the temporary road to unit 64410; state in the road contract that this flagged area is to be avoided;

4) A botanist/plant ecologist shall flag the *Platanthera chorisiana* populations near roads 75007 and 7508, and shall be present during the final field location/marking of these road corridors; the locations shall be moved as much as is feasible to avoid known orchid populations;

5) A botanist/plant ecologist shall be present during or prior to unit layout in a few selected areas to further survey for sensitive plants;

6) Collecting plants and plant parts shall not be allowed except by permit issued by the Forest Supervisor for scientific or educational purposes;

7) No herbicide shall be applied within 100 feet of any known sensitive plant. If herbicides are needed, buffers will be clearly marked before treatment so applicators can easily see and avoid the sensitive plants;

8) Plants native to southeast Alaska will be used for any revegation or restoration work in the Project Area.

Risk Assessment for Sensitive Plants

If a sensitive plant has been determined to be within the Project Area or within an area influenced by the project, then a risk assessment (analysis of impacts of the project on the species) is indicated. A risk assessment considers two factors: Factor 1) the consequence of adverse (or beneficial) effects on the

population, and Factor 2) the likelihood or probability that these effects will occur. Levels of consequence and levels of likelihood are described in Appendix F under the heading "Criteria for Risk Assessment." Sensitive plants were found, and a complete survey was not possible, so a risk assessment was prepared for the Project Area.

The direct, indirect and cumulative effects of the proposed project are used to determine the level of consequence and level of likelihood. After both of the factors have been determined, the preparer analyzes the significance of the effects of the proposed project on the sensitive plant. This process documents the rationale for arriving at the determination of effect (according to WO letter dated May 12, 1992).

The impacts of timber harvest, road building, and LTF construction are different, so these activities are analyzed separately.

Timber Harvest

The **consequences of adverse impacts** to sensitive plants due to timber harvest are **high** because timber harvest results in significant habitat disturbance through tree falling, removal, dragging, and slash piling. Sensitive plants most likely to be affected by timber harvest are *Arnica lessingii* ssp. *norbergii*, *Draba borealis* var. *maxima*, *Hymenophyllum wrightii* and *Poa laxiflora*.

The **likelihood of adverse effects** is **high for *Platanthera chorisiana*** because these sensitive plants were found in two of the proposed units surveyed in the Project Area. The **likelihood of adverse effects** is **low for other sensitive taxa** because: 1) no other taxa were found in surveys; 2) there are no previously known populations of sensitive plants in the Project Area; 3) most of the Sitka and Hoonah Districts sensitive plants do not occur in the forest habitat proposed for harvest; and 4) no long-term change in habitat type is expected. By alternative, the timber harvest impacts are as shown in Table 5. Alternative F would impact the greatest total acreage, which is likely to include the greatest acreage of sensitive plant habitat.

Table 5. Timber harvest impacts by alternative (Sources for acres, mmbf, area: Sherrod 1996, Nelson 1996)
Note that less than the total proposed harvest acreage is sensitive plant preferred habitats.

Alternative	Proposed harvest acres	Proposed output mmbf	% Project Area*
A	0	0	0
B	2,038	25.1	5.7%
C	2,028	30.9	5.7%
D	1,748	25.9	4.9%
E	1,662	25.8	4.7%
F	2,517	39.8	7.0%

*Total Forest Service land in the Project Area including LUD III special, encumbered lands, and partial interest lands but excluding private lands is 35,723 acres. Obviously, much less than this amount is harvestable; the percentages are given for comparison purposes only.

Road Construction

The **consequences of adverse impacts** to sensitive plants due to road construction are **high** because habitats and populations in road corridors are destroyed. Some proposed roads are intended as temporary roads, but the change in habitat is often permanent. The sensitive plants most likely to be affected by road construction are: *Arnica lessingii* ssp. *norbergii*, *Carex lenticularis* var. *dolia*, *Dodecatheon pulchellum* ssp. *alaskanum*, *Draba borealis* var. *maxima*, *Hymenophyllum wrightii*, *Ligusticum calderi*, *Platanthera chorisiana*, *Platanthera gracilis*, *Poa laxiflora*, *Romanzoffia unalaschcensis*, *and Senecio moresbiensis.*

The **likelihood of adverse effects** is **high for *Platanthera chorisiana*** because these sensitive plants were found in several road corridors. The **likelihood of adverse effects** is **low for other sensitive taxa** because: 1) no other sensitive plants were found in the preferred habitats surveyed in the project area; 2) there are no previously known populations of sensitive plants in the Project Area; and 3) the total acreage of the Project Area that will be converted to roads is low. By alternative, the road construction impacts are as

shown in Table 6. Alternative F would impact the greatest total mileage, which is likely to include the greatest amount of sensitive plant habitat.

Table 6. Road construction impacts by alternative (Sources for mileage, area: Sherrod 1996, Nelson 1996)
Note that less than the total proposed road acreage crosses sensitive plant preferred habitats.

Alternative	New road miles/acres*	Reconstructed road** miles/acres	% Project Area#
A	0	0	0
B	7.8/47	21.6/131	0.50%
C	9.5/58	21.7/132	0.53%
D	9.2/56	10.7/65	0.34%
E	8.4/51	21.6/131	0.51%
F	9.7/59	22.1/134	0.54%

*Minimum clearing for the standard 14-foot road is 44-46 feet; a 50-foot width was used as an average clearing size to calculate the extent of disturbance

**Much of this acreage has already been impacted and is unlikely to be sensitive plant habitat

#Total Forest Service land in the Project Area including LUD III special, encumbered lands, and partial interest lands but excluding private lands is 35,723 acres.

LTFs

New LTFs are proposed at 10-mile and Sunny Cove Too, as is reconstruction of the existing Sunny Cove LTF under the various alternatives. The **consequences of adverse impacts** to sensitive plants due to LTF construction are **high** because habitats and populations in LTF sites are destroyed. Although the sites are only used on short-term bases for log transfer, they are likely to be reactivated for future harvest, and used as recreational access points so that ground disturbance continues after the proposed log transfer is complete. The sensitive plants most likely to be affected by LTF construction are: *Dodecatheon pulchellum* ssp. *alaskanum*, *Platanthera chorisiana, Platanthera gracilis, Poa laxiflora, Puccinellia kamtschatica,* and *Botrychium ascendens.*

The **likelihood of adverse effects** is **low for *Platanthera chorisiana* and other sensitive taxa** because 1) no sensitive plants were found at the 10-mile LTF site; 2) there are no previously known populations of sensitive plants in the Project Area; and 3) the total acreage of the project area that will be converted to LTFs is low. A maximum of two new transfer sites is proposed. The existing LTF at Sunny Cove may be reconstructed, but this should not involve any decrease in sensitive plant habitat over the existing impacted area. The Sunny Too site was not surveyed since it was added as a possibility after surveys were scheduled. By alternative, the LTF impacts are as shown in Table 7. Alternative B would have the greatest impact since it has a new LTF and the reconstruction.

Table 7. LTF impacts by alternative (Source: Sherrod 1996)

Alternative	LTFs proposed
A	none
B	Sunny Cove, 10-mile
C	Sunny Too
D	10-mile
E	Sunny Cove
F	Sunny Too

For *Platanthera chorisiana*, known effects by alternatives range as shown in Table 5. Alternatives C, D, E, and F would have comparable negative effects on the known populations. Alternative F would likely have the greatest negative effect on any unknown populations since it impacts more acres than the other alternatives.

Table 5. Negative and positive known effects on *Platanthera chorisiana* from proposed actions

Effects	Alternatives including effect
Negative	
Temporary road to unit 64410 may impact known population directly if road cannot avoid the plants, or indirectly from road effects	B, C, D, E, F
Known plants in unit 63510 likely to be impacted although may be placed in reserve areas (harvest calls for clearcut with reserves)	C, D, E, F
Known plants on proposed road 75007 likely to be impacted directly and indirectly although some of population will be protected by road location change	B, C, D, E, F
Known plants on proposed road 7508 to unit 64010 likely to be impacted although may be free of direct impacts if road can be moved slightly	C, D, E, F
Positive	
Protection of known population in unit 62510 since unit dropped	A, B, C, D, E, F
Protection of all known and unknown populations	A (no action)
Protection of known plants outside unit 2710 since road dropped (helicopter unit)	A, B, C, D, E, F

The **overall risk to *Platanthera chorisiana*** due to project activities is **high** because known populations will be impacted indirectly, if not directly, by project implementation. However, other known *Platanthera chorisiana* populations will be protected in parts of the Project Area, so that a viable population is likely to remain in the Project Area. As noted earlier, this sensitive plant is thought to be more common than previously estimated, according to Mary Stensvold, Regional Botanist, and populations are also known from outside the Project Area.

The **overall risk to sensitive plants other than *Platanthera chorisiana*** due to project activities is **moderate** because it is unlikely that significant populations of sensitive plants occur in the areas proposed for activities, but if they do occur, impacts would be high on those populations.

The ratings for the risk assessment are defined in Appendix F.

Determinations

Based on the rationale described above, the alternative courses of action (**including the listed mitigation measures**) will result in the following impacts on sensitive plants. Determinations are listed by activity type and separately for the sensitive species known to occur in the Project Area and for the other sensitive plants which might occur. Determinations are per May 15, 1992 letter of direction from WO.

For *Platanthera chorisiana*, **timber harvest** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

For the other sensitive plants which could occur in the Project Area, **timber harvest** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

For *Platanthera chorisiana*, **road construction/reconstruction** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

For the other sensitive plants which could occur in the Project Area, **road construction/reconstruction** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

For *Platanthera chorisiana*, **LTF construction /reconstruction** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability.**

For the other sensitive plants which could occur in the Project Area, **LTF construction /reconstruction** under any of the five action alternatives **may impact individuals but is not likely to cause a trend to federal listing or loss of viability**.

The no action alternative would have no impact on *Platanthera chorisiana* or any of the other sensitive plants which could occur in the Project Area.

Additional Management Recommendations

IF ANY PREVIOUSLY UNDISCOVERED SENSITIVE PLANTS OR PROPOSED SENSITIVES ARE ENCOUNTERED AT ANY POINT IN TIME PRIOR TO OR DURING IMPLEMENTATION OF THIS PROJECT, WORK WILL BE HALTED UNTIL THE REGIONAL BOTANIST AND/OR FOREST ECOLOGIST IS CONSULTED AND NECESSARY MITIGATION MEASURES ARE ENACTED.

MONITORING

Monitoring of the known populations and additional surveys for *Platanthera chorisiana* should occur in the project area, to determine extent, health and stability of populations, and habitat requirements.

Known populations of the orchids shall be mapped on confidential aerial photographs and/or topographic maps which are not available for public scrutiny. (Locations shall be kept confidential until more is known about the populations, their distribution and habitat requirements.) Annual stem counts of these populations shall occur in mid-late July. Hoonah or Sitka Ranger District Biologists or Biological Technicians can conduct these counts with training from the Regional Botanist or Forest Ecologist. Dominant plant species in the orchid habitat shall be recorded with their percent cover on a 2 by 2 m quadrat, centered over at least one main orchid cluster in each population. Population vigor shall also be recorded (qualitative observations), along with observations on any disturbance that may have occurred to the area. Monitoring results will be reported to the Regional Botanist who will determine appropriate responses to any significant population change (increase or decrease). Monitoring plans may be updated in the future depending on stability of populations; e.g., stem counts may be decreased to a biannual frequency. Population photographs may also be taken as part of monitoring.

No collection of orchids shall occur as part of the monitoring, unless requested by the Regional Botanist.

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Appendix A:

SENSITIVE SPECIES LIST
VASCULAR PLANTS
ALASKA REGION

1. Crucifer, no common name (*Aphragmus eschscholtzianus*)
2. Norberg arnica (*Arnica lessingii* ssp. *norbergii*)
3. Goose-grass sedge (*Carex lenticularis* var. *dolia*)*
4. Edible thistle (*Cirsium edule*)
5. Pretty shooting star (*Dodecatheon pulchellum* ssp. *alaskanum*)
6. Northern rockcress (*Draba borealis* var. *maxima*)
7. Kamchatka rockcress (*Draba kamtschatica*)
8. Tundra whitlow-grass (*Draba kananaskis*)
9. Davy mannagrass (*Glyceria leptostachya*)
10. Wright filmy fern (*Hymenophyllum wrightii*)
11. Truncate quillwort (*Isoetes truncata*)
12. Calder lovage (*Ligusticum calderi*)
13. Pale poppy (*Papaver alboroseum*)
14. Choris bog orchid (*Platanthera chorisiana*)
15. Bog orchid (*Platanthera gracilis*)
16. Loose-flowered bluegrass (*Poa laxiflora*)
17. Smooth alkali grass (*Puccinellia glabra*)
18. Kamchatka alkali grass (*Puccinellia kamtschatica*)
19. Straight-beak buttercup (*Ranunculus orthorhynchus* var. *alaschensis*)
20. Unalaska mist-maid (*Romanzoffia unalaschcensis*)
21. Queen Charlotte butterweed (*Senecio moresbiensis*)
22. Circumpolar starwort (*Stellaria ruscifolia* ssp. *aleutica*)

May be added to list in future:

23. Smooth-fruited netleaf willow (*Salix reticulata* ssp. *glabellicarpa*)
24. Ascending moonwort (*Botrychium ascendens*)*

*Also USFWS Species of Concern

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Southeast Alaska Ecological Services
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801-7100

IN REPLY REFER TO:

December 17, 1996

Gary Morrison
Forest Supervisor
USDA, Forest Service
Chatham Area
204 Siginaka Way
Sitka, AK 99835

Dear Mr. Morrison:

The U.S. Fish and Wildlife Service has reviewed the November 22, 1996 biological assessment for the proposed Indian River Timber Sale on Chichagof Island, near Tenakee, Alaska. The assessment evaluated the effects of proposed action on the endangered American peregrine falcon (Falco peregrinus anatum).

For the purposes of The Endangered Species Act (ESA), Section 7 consultation, we concur that populations of the American peregrine falcon would not likely be adversely affected as a result of the proposed project.

Although not specifically required by the consultation provisions of the Endangered Species Act, we appreciate your consideration of the Service's Species of Concern in the biological assessment. Your consideration of these species is important for their conservation and assists in preventing their inclusion on the Endangered Species list.

For the purposes of technical assistance, we offer the following comments for your consideration. Based on the evaluation of effects contained in the biological assessment, you have concluded that some degradation and fragmentation of old growth forest habitat will occur in the proposed project area. We are concerned about the additive effects such habitat degradation is having on species productivity and viability, particularly regarding Species of Concern. Numerous drainages on Chichagof Island, particularly Northeast Chichagof, have been heavily logged, including those on Native lands. Such actions serve to magnify the effect of management on Forest Service lands as they relate to the entire ecosystem of Southeast Alaska.

These comments are offered for endangered and threatened species for which the U.S. Fish and Wildlife Service has responsibility under Section 7 of the Endangered Species Act of 1973 (16 USC 1521 et seq.) and its amendments. The above comments are specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities.

If you have any questions please contact Ed Grossman or myself at (907) 586-7240.

Sincerely,

Ed Grossman

for John Lindell
Endangered Species Specialist

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

November 29, 1996

Mr. Gary A. Morrison
Forest Supervisor
U.S. Forest Service
Tongass National Forest
Chatham Area
204 Siginaka Way
Sitka, Alaska 99835

Dear Mr. Morrison:

The National Marine Fisheries Service has reviewed the Biological Assessment/Biological Evaluation for the proposed Indian River Timber Sale Project and concurs that the project is not likely to adversely affect any threatened or endangered species under our jurisdiction. This determination is based on U.S. Forest Service adherence to the enclosed "Forest-wide Standards & Guidelines for Threatened, Endangered, Candidate, and Sensitive Species." To update information used in these guidelines, we have also enclosed a copy of the "1996 Guide to Viewing Marine Mammals in Alaska."

This concludes Section 7 consultation between the U.S. Forest Service and NMFS for the Tongass National Forest Plan Revision Biological Assessment. However, should project plans change or new information become available that changes the basis of this decision, then consultation should be reinitiated.

Please contact Linda Shaw of my staff at (907) 586-7510 if you have any further questions.

Sincerely,

for Steven Pennoyer
Administrator, Alaska Region

Enclosures

United States Department of Agriculture | Forest Service | Alaska Region | P.O. Box 21628 Juneau, AK 99802-1628

.....File Code: 2670 Date: May 11, 1999

Route To:

Subject: Sensitive Species List, Technical Revision

To: Forest Supervisors, Assistant Forest Supervisors, and Staff Directors

The Regional Forester's Sensitive Species list was last revised on January 3, 1994, to include 22 plants. Sensitive species are those species for which population viability is a concern, as outlined in Forest Service Manual 2670. This list is intended to be dynamic, with periodic revisions to reflect the best scientific information available. The Regional Botanist coordinated a re-evaluation of the list to determine if sensitive species designation is still appropriate for the plants added to the list in 1994. Forest Service botanists, the Alaska Natural Heritage Program (ANHP) botanist, a taxon specialist at the Missouri Botanical Garden, and botanists at the University of Alaska Herbarium contributed to this work. As a consequence of this re-evaluation, I am making a technical revision to the list to remove the following four plants:

Northern rockcress (*Draba borealis* var. *maxima*)
Kamchatka rockcress (*Draba kamtschatica*)
Choris bog orchid (*Platanthera chorisiana*)
Straight-beak buttercup (*Ranunculus orthorhynchus* var. *alaschensis)*

The rationale for removing these plants from the Sensitive Species list is detailed here.

Draba borealis var. ***maxima***, Northern Rockcress.
Draba borealis var. *maxima* has been united with *D. borealis* in recent taxonomic studies by Rollins. He does not consider the variety *maxima* to be a distinct taxon, but rather a minor variant of the widespread *D. borealis*. Because *D. borealis* is relatively common, it does not warrant sensitive designation.

D. borealis var. *maxima* was described (separated from *D. borealis*) by Hulten in 1945, based on a type specimen grown from the seed of a plant collected at Mendenhall Glacier. The variety *maxima* was considered to be endemic to the area extending from Kodiak Island through the northern Tongass National Forest and adjacent British Columbia.

Draba kamtschatica, Kamchatka Rockcress.
Recent taxonomic work by Rollins and Mulligan indicates that the plant given this name in Alaska should be treated as *Draba lonchocarpa* var. *vestita.* Its range extends from the mountains of south coastal Alaska through the mountains of coastal British Columbia. The entity *D. lonchocarpa* var. *vestita* is more abundant and widespread than the Alaskan plant that was called *D. kamtschatica.* Since the correct name for the plant is now *D. lonchocarpa* var. *vestita* and because the plant is more abundant than previously thought, *D. kamtschatica* is being removed from the Regional Forester's Sensitive Species list.

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Platanthera chorisiana, Choris Bog Orchid.
This plant is being removed from the list because it is more common than previously thought. Intensive surveys by Forest Service botanists for this inconspicuous orchid began when it was designated as sensitive. The ANHP considered it to be an extremely rare plant and ranked it as a G2G3, meaning that the abundance of the orchid was between "imperiled globally" and "either vary rare and local throughout its range, or found locally in a restricted range." As a result of intensive surveys, numerous occurrences of this plant throughout its range in the Alaska Region were documented. Botanists at ANHP agree that the plant is not extremely rare, and is no longer tracking its occurrences. The ANHP currently ranks this plant as a G3G4, meaning that the abundance of the orchid is between "either vary rare and local throughout its range, or found locally in a restricted range," and "apparently secure globally."

The range of this orchid extends from Japan, through Kamchatka across the Aleutian Islands, Prince William Sound, southeastern Alaska, and southeast to Washington State. It grows in bogs, bog edges, open mixed conifer forests, subalpine meadows and heaths throughout the Alaska Region.

Ranunculus orthorhynchus var. ***alaschensis***, Straight-beak Buttercup.
The treatment of the genus *Ranunculus* in Flora of North America, Volume 3, realigns this variety to be synonymous with the more common *Ranunculus orthorhynchus* var. *orthorhyncus*. Therefore, *R. orthorhynchus* var. *alaschensis* is no longer recognized as the correct name for this entity. The range of *R. orthorhynchus* var. *orthorhyncus* extends from the Alaska panhandle south to central California. Because *R. orthorhynchus* var. *orthorhyncus* is relatively common and wide ranging, it does not warrant sensitive designation.

The revised sensitive species list for plants is enclosed.

Biological evaluations will no longer need to be conducted for the four plants removed from the list. Please contact Mary Stensvold, Regional Botanist, at (907) 747-4210 for additional information regarding this revision.

/s/ James A. Caplan for

RICK D. CABLES
Regional Forester

Enclosure

Author: fww, mstensvo, 05/05/1999 03:03pm
Concur: sport, dnix, 05/06/1999 11:25am
Concur: wfew, mpeterso, 05/06/1999 12:51pm
Concur: wfew, jfranzex, 05/10/1999 05:03pm
Concur: rf, mrivera, 05/11/1999 11:08am
Concur: rf, jcaplan, 05/11/1999 04:29pm

ALASKA REGION SENSITIVE VASCULAR PLANTS

Eschscholtz's little nightmare	(*Aphragmus eschscholtzianus*)
Norberg arnica	(*Arnica lessingii* ssp. *norbergii*)
Goose-grass sedge	(*Carex lenticularis* var. *dolia*)
Edible thistle	(*Cirsium edule*)
Pretty shooting star	(*Dodecatheon pulchellum* ssp. *alaskanum*)
Tundra whitlow-grass	(*Draba kananaskis*)
Davy mannagrass	(*Glyceria leptostachya*)
Wright filmy fern	(*Hymenophyllum wrightii*)
Truncate quillwort	(*Isoetes truncata*)
Calder lovage	(*Ligusticum calderi*)
Pale poppy	(*Papaver alboroseum*)
Bog orchid	(*Platanthera gracilis*)
Loose-flowered bluegrass	(*Poa laxiflora*)
Smooth alkali grass	(*Puccinellia glabra*)
Kamchatka alkali grass	(*Puccinellia kamtschatica*)
Unalaska mist-maid	(*Romanzoffia unalaschcensis*)
Queen Charlotte butterweed	(*Senecio moresbiensis*)
Circumpolar starwort	(*Stellaria ruscifolia* ssp. *aleutica*)

Appendix C

Enhancement Opportunities Mitigation, and Monitoring

Appendix C
Enhancement Opportunities and Mitigation Measures

Enhancement Opportunities

Silviculture

Silviculture enhancement opportunities include both post-harvest hand planting and post-harvest precommercial thinning. In addition there are silviculture opportunities in previously harvested units. Further field work is needed to identify specific timber stands where post-harvest silviculture treatment is most appropriate. In general, many of these stands are in riparian areas, where silviculture treatments would benefit other resources besides timber production, including wildlife, fisheries, soils, and watershed.

Silviculture treatments are expected to occur in the Indian River Project Area after timber harvest activities are completed. These treatments include hand planting, precommercial thinning of proposed harvest units, and surveys of possible precommercial thinning of previously harvested areas.

Hand Planting

Hand planting of Sitka spruce and Alaska-cedar is proposed for units to be harvested using the clearcut with green tree retention harvest method, where a significant portion of the existing stand is composed of one of these species. This will maintain cedar as a component in the post-harvest stand, and will alleviate concerns over natural regeneration of yellow-cedar following harvest. In addition, planting spruce and Alaska-cedar will improve structural and horizontal diversity in the post-harvest stand. Table C-1 shows units proposed for hand planting by alternative.

Table C-1
Units Proposed for Hand Planting

Alternative B	Units
146 Acres	2220, 2310, 2810, 2820, 62720, 63840, 63920
Alternative C	Units
209 Acres	2810, 2820, 3112, 60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative D	Units
114 Acres	60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative E	Units
156 Acres	2310, 2340, 3020, 62720, 62730, 62740, 62840, 62850, 63110, 63510, 63920, 63960, 63970, 63971, 65013
Alternative F	Units
281 Acres	2220, 2310, 2340, 2810, 2820, 3010, 3020, 3112, 60420, 62730, 62840, 63110, 63510, 63920, 63960, 63970, 63971, 65013

Source: USDA Forest Service SIS 1996

Precommercial Thinning

Precommercial thinning to control stocking and species composition, as well as to improve wildlife habitat, is projected for 209 acres of past harvest in VCU 2221 in all alternatives. Units harvested under this project would be surveyed for precommercial thinning needs between 15 and 20 years after harvest. Projections are based on units with a site index equal to or greater than 80, as these are the most productive sites and would be the highest priority for thinning. Additional units may be thinned, based on benefits to wildlife and/or availability of funding.

Silviculture Treatments in Previously Harvested Areas

Surveys for precommercial thinning needs are scheduled in the Project Area for areas that have previously been harvested. Table C-2 displays planned surveys, by VCU and calendar year for which survey is scheduled. Large portions of the acres displayed in the table are anticipated to be thinned for wildlife benefits as well as timber production values. Many of these areas have high wildlife value and use; mixed grid spacings, thickets, and gaps will be created during thinning operations in these areas to enhance forage production, hiding cover, and thermal cover requirements for wildlife.

Additional acres located adjacent to these harvest areas may be considered for riparian thinning projects. Many of these occur in riparian areas, where past harvest often removed a portion or all of the large trees adjacent to the stream. Riparian thinning may be used in some cases to increase species diversity, maintain/enhance wildlife travel corridors, and enhance tree growth to accelerate production of large trees to provide future large woody debris input into the stream system.

Table C-2
Precommercial Thinning Surveys of Previously Harvested Units Within the Project Area

VCU	Total Acres	Calendar Year Survey Scheduled
2160	35	1999
2160	546	2000
2160	10	2001
2220	345	1999

Source: USDA Forest Service SIS 1996

Fisheries, Watershed, and Road Management Improvement Opportunities

A watershed analysis has been completed in the Project Area. Several watershed improvement needs and enhancement opportunities have been identified. (Indian River Watershed Analysis (IRWA), Paustian et al. 1996.) In general, fisheries and watershed rehabilitation work includes:

- Riparian thinning in second growth stands along Class I and II streams.
- Road maintenance such as drainage structure maintenance or replacement on existing roads near Class I and II streams, armoring on fill/cut slopes where runoff enters streams, replacement of culverts that are too small, and replacement of culverts which block fish access to Class I and II stream habitat.

Fisheries enhancement opportunities already completed in the Project Area include construction of a fishpass at the Indian River barrier falls to open up 8 to 10 miles of main-channel stream to coho salmon, and stocking of chinook salmon fry in the river. (See the Soils, Fish, and Water section in Chapter 3 of this EIS.)

Recreation

Roads could be converted to trails after logging is completed. Maintenance Level I roads could be brushed and used as hiking and cross-country ski trails (See Appendix D - Road Management Objectives, for information on road maintenance levels proposed in each alternative).

Other recreation trail opportunities include: 1) re-establishing the trail from Tenakee Springs to the head of Tenakee Inlet and inland hot springs along with a hut-to-hut system to allow overnight camping, in VCUs 2200, 2210, and 2220. 2) Improving and designating an existing hunting trail off the 10-Mile road system accessing alpine in VCU 2220. 3) Constructing more trails accessible from Tenakee Springs in VCUs 2200, 2210, and 2220. 4) Constructing a loop trail for hiking and cross-country skiing in VCU 2220. The trail would utilize portions of the existing Indian River road and a new trail over the ridge to Tenakee Springs. 5) Constructing a Forest Service cabin six to eight miles from saltwater near the Indian River road to provide overnight accommodations for hikers, skiers, and hunters.

Mitigation Measures

The application of mitigation measures begins during the planning phase of a project. Issues raised during scoping were used to identify resource areas where mitigation would be needed. Standards, guidelines, and direction contained in the modified 1997 Forest Plan, the Alaska Regional Guide, and applicable Forest Service manuals and handbooks were applied in developing alternatives and designing harvest units and roads.

A brief summary of mitigation measures common to all alternatives follows. Specific mitigation measures, as applied to individual roads and units, are shown in the road and unit cards (Appendices I and J). These cards list design considerations and provide a mechanism for tracking the project implementation.

Water Quality and Fish Habitat

Measures that protect water quality and fish habitat in the Project Area include management direction and guidelines in the modified 1997 Forest Plan, Best Management Practices (BMPs), the Tongass Timber Reform Act (TTRA), and the Indian River Watershed Analysis (IRWA). The modified 1997 Forest Plan Riparian Standards and Guidelines and the TTRA prescribe buffers of varying widths within Riparian Management Areas. The 100-foot stream buffer width on all Class I streams and on Class II streams that flow directly into Class I streams as mandated by TTRA is a minimum. Refer to Appendix J (Unit Design Cards) for the unit-specific stream buffering which is being applied. Refer to the Vegetation section in Chapter 3 and the Soils, Water, and Fish section in Chapter 4 for a complete discussion of Riparian Management Areas, as related to protection of water quality and fish habitat.

Wildlife

Mitigation measures that protect water quality, fish, and riparian habitat also protect wildlife habitat for species such as brown bear and furbearers. Effects on wildlife are also reduced by intentionally harvesting units away from important wildlife habitats, to the extent practicable. Beach and estuary fringe habitats were avoided, and travel corridors left , where practicable, to allow undisturbed movement of wildlife.

In addition, impacts to wildlife would be mitigated by closing roads to motorized vehicles, retaining snags where safe to do so, and scheduling harvest activities to reduce disturbance to bald eagle nesting and rearing activities. Impacts to brown bear from bear-people interactions would be mitigated by informing logging camp residents about brown bear behavior and bear management policies. Incinerators would be used in logging camps for garbage disposal to prevent bear-garbage problems. Old-growth Reserves have been identified to maintain biodiversity and viable populations.

Recommended mitigation for other wildlife species include:

- For active marbled murrelet nest, protect 600-foot circular habitat around nest site until nestling fledges.
- For occupied great blue heron nest site, protect with a 600-foot buffer of undisturbed habitat March 1 to July 31.
- For active northern goshawk nest site, follow standards and guidelines, protect with a 100-acre buffer of undisturbed habitat, and have seasonal restrictions.
- For other active raptor nest site(s), protect nest stand during nesting season.

Subsistence

Because most subsistence use involves harvesting fish and game, mitigation measures that protect or enhance fish and game resources will also protect and enhance subsistence activities. Other mitigation measures were built into each of the action alternatives by placing units and roads away from beach and estuary fringe habitats and away from salmon-bearing streams. Also, road management can be used to maintain traditional access methods or create additional use areas.

Recreation

Because many recreation activities that take place in the Project Area are related to the consumptive use of fish and wildlife, mitigation measures that protect fish and game resources will also protect private and commercial recreation uses.

In all action alternatives, the timber sale contractor would be required to maintain clear access to the East Tenakee Trail during sale operations. After harvesting has been completed, any damage to the trail would be corrected to Forest Service trail standards by the contractor. These provisions would be included in the timber sale(s) contract (Nelson, 1996).

Scenic Quality

Visual impacts of the proposed units were mitigated by maintaining screens of trees along brushfields, following natural land forms with openings, avoiding long horizontal lines, and maintaining key viewsheds. In some areas, units were omitted that might have been visible to small boat users. In areas where harvest would be visible from the main travel routes, alternative silviculture methods would be employed that harvest less than 50 percent of the volume in a unit. None of the action alternatives propose units or roads in the areas of high or exceptional visual quality.

Leaving buffers of timber along beaches and inland lakes would reduce effects of timber harvest on views from anchorages and known recreational day-use areas. Roads and rock borrow pits would be located to minimize visibility, where practicable, in scenic viewsheds.

The upland staging area and East Tenakee Trail would be screened by a buffer of shoreline trees as wide as practicable at the Sunshine Cove LTF site.

Helicopter logging has also been recommended to eliminate the need for roads which otherwise could create a significant and long-lasting visual impact.

Heritage Resources

Impacts to heritage resources would be mitigated to the fullest extent possible, in consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, federally recognized tribes, and in cooperation with local residents and native groups. (See the Heritage Resources section in Chapter 4 for detailed discussion of mitigation measures pertinent to Alternative F and the East Tenakee Trail.)

Marine Resources

Appropriate marine protection measures would be implemented for all action alternatives. Guidelines developed by the Alaska Terminal Transfer Facility (ATTF) Guidelines Technical Subcommittee describe the physical requirements that are necessary to construct and operate a LTF for the protection of marine resources. The guidelines include mitigation measures and BMPs that decrease environmental impacts from LTFs, log raft areas, and adjoining facilities. (See LTF-Siting, Construction, and Operation Guidelines in Appendix K.) Following is a sample of these measures:

- Select a practicable log entry system that best minimizes fill placement impacts.
- Fill structures at the LTF site should be designed and constructed to avoid introducing fine sediments and organic matter into the water.
- In-water construction and filling should be timed to reduce impacts to marine and anadromous fisheries resources.
- Disposal of solid wastes should follow 18 Alaska Administrative Code (AAC) 60, which requires that solid waste be properly disposed of at an approved disposal site.
- Threshold limits are imposed on bark accumulation levels as a condition of the tidelands permit.
- The speed at which log bundles enter the water when a low-angle ramp system is used should be the slowest practicable speed achievable.
- The log transfer system and sort yard equipment should be operated and maintained to minimize petroleum and lubricating products from entering marine waters.

Sunshine Cove LTF Tidelands
Timber previously harvested in the Indian River, 10-Mile Creek, and Freshwater Creek drainages was hauled to an LTF site in Sunshine Cove. The cove is located approximately three miles southeast of the City of Tenakee Springs. The LTF was last used in 1986.

A Memorandum of Understanding (MOU) was signed in November 1996, between the City of Tenakee Springs and the Forest Service. Tenakee Springs voters approved the MOU in January 1997. The MOU was necessary to address concerns of the citizens of Tenakee Springs with regard to Forest Service use and occupation of City-owned tidelands in Sunshine Cove. The complete text of the MOU is contained in Appendix L of this EIS.

The MOU addresses use of tidelands at and adjacent to the former LTF site, and documents compensation to be paid to the City of Tenakee Springs for use or occupation of their tidelands. As long as the Forest Service (including its Timber Sale Purchasers, Contractors, and Assignees) complies with the terms of the MOU, Tenakee Springs shall not terminate the MOU prior to December 31, 2003.

The following mitigation measures requested by the City of Tenakee Springs are also addressed in the MOU:

- No logging camps are allowed within the city limits of Tenakee Springs.
- The East Tenakee Trail, within the road right-of-way, will be properly maintained and protected by the Forest Service against impacts that may render it impassable or difficult to use as a result of logging activities.
- Vehicles traveling within 0.25 miles of the LTF and East Tenakee Trail will be limited to a maximum speed of 10 miles per hour.
- Vehicles and other machinery operating near the LTF will be muffled so as to comply with applicable Federal and State standards.
- Use of helicopters at the tidelands area will be limited to emergencies or other non-recurring situations, and they may not be used for timber delivery nor routinely fueled on the site.
- Notice of blasting activities shall be posted in Tenakee Springs and guards will be utilized on the trail when blasting activities are conducted. Blasting shall only occur between the hours of 8:00 a.m. and 5:00 p.m.

Monitoring

Implementation Monitoring

Timber Unit Layout

Objective:	To minimize the effects of timber harvest on other natural resources.
Desired result:	Unit card design specifications allow timber harvest to "lay lightly" on the land.
Measurement:	Sale layout employees will follow guidance on the cards. Other resource specialists will assist in unit layouts as indicated on the unit cards. All units (100 percent) implemented each year will be checked for compliance with unit card design (BMPs 13.3, 13.8).
Threshold:	Unit sample should be within 10 percent of the parameters stated on the unit card.
Corrective action:	If needed, determine why unit was not laid out as designed. Document changes if they benefit the environment; change unit layout to match the design if effects are within BMPs.
Responsible staff:	District sale layout employees.
Record of results:	As-laid-out unit cards.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Timber Unit Yarding

Objective:	To ensure yarding minimizes the potential risk of soil loss in units with high-hazard soils.
Desired result:	Use of log suspension and yarding away from V-notches to protect high-hazard soils from erosion.
Measurement:	Sale administrator will ensure log suspension occurs in designated units. Specialists will check 100 percent of the units with high hazard soils for compliance with BMPs (BMPs 13.2, 13.4, 13.5, 13.9, 13.12, and 13.15).
Threshold:	Exposure of more than 10 percent of the affected area to bare mineral soil.
Corrective action:	Stop implementation and resolve among sale administrator, soil scientist, and timber sale operator. If not resolvable at the field level, bring to District Ranger.
Responsible staff:	Soil Scientist and SRD sale administration employees.
Record of results:	Daily diaries of engineering representatives and sale administrators, and memos of soil scientist documenting field verification activities.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Road Location and Design

Objective:	To ensure that roads are located and designed as specified in the EIS and on the road cards.
Desired result:	Road survey and design standards capture the stated intent of the EIS, which is to minimize impacts to soil and water resources (BMPs 14.2, 14.5, 14.6, 14.10, 14.12, and 14.4). Post sale road management is implemented as specified in the EIS.
Measurement:	Engineering representatives and road designers will review roads during contract preparation, field design staking, and at the close of the timber sale. Final plan-in-hand review will ensure compliance with RMOs.
Threshold:	Less than 10 percent variation between plans and field location. No variation from specified road management.
Corrective action:	Correct designs as needed in the pre-implementation stages. During plan-in-hand review, implement changes specified in design if not in compliance. Implement specified road management.
Responsible staff:	Engineering staff, and District Ranger for final approval.
Record of results:	Road survey and designs, and memos noting plan-in-hand review.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Slope Stabilization

Objective:	To determine if road designs and construction have met the intent of the EIS to reduce risk, of mass failure.
Desired result:	Design roads that minimize the potential for road-related mass failures during and after timber harvest (BMPs 14.7, 14.8, 14.12, and 14.20).
Measurement:	Engineering representatives and road designers will review roads during contract operations, assisted by the soil scientist or geotechnical engineer as needed. Final plan-in-hand review will ensure compliance with road design standards. The survey of timber unit areas and roads five years following close of operations will be scheduled by soil scientist or geotechnical engineer.
Threshold:	Less than 10 percent variation between plans and implementation.
Corrective action:	Correct designs as needed in the pre-implementation stages. During plan-in-hand review, contractor implements changes specified in the design if not in compliance.
Responsible staff:	Engineering staff and soils staff, District Ranger for final approval.
Record of results:	Road survey and designs, and memos noting plan-in-hand review or findings of soil scientist.
Annual cost:	$4,000.
Extra FTE needs:	0.2 FTE, a geotechnical engineer as needed.

Erosion Control Measures

Objective:	To minimize erosion and sedimentation in timber harvest and road construction and maintenance activities.
Desired result:	Road survey and design standards capture the stated intent of the EIS, which is to minimize the risk of soil erosion and sedimentation to streams (BMPs 13.13, 13.16, 13.17, 14.5, 14.11, 14.16, 14.17, 14.18, 14.20, 14.22, and 14.26).
Measurement:	Engineering representatives and road designers will review roads during and following contract operations, assisted by soil scientist as needed. Periodic survey following close of operations will be scheduled by the soil scientist.
Threshold:	Erosion control methods in place 90 percent of the time.
Corrective action:	Correct designs as needed in the pre-implementation stages. During sale operations, contractor will implement changes specified by design guidelines if not in compliance.
Responsible staff:	Engineering staff and soils staff (post-harvest).
Record of results:	Daily diaries of engineering representative; following sale operations, results recorded by soil scientist in follow-up reviews.
Annual cost:	$3,000.
Extra FTE needs:	0.1 FTE.

LTFs Spill Control Measures

Objective:	To ensure that petroleum spills do not affect marine waters.
Desired result:	LTF design and implementation will prevent fuel spillage from entering nearby waters.
Measurement:	Routine observation by LTF operator for oil sheen as required by EPA 402 permit (BMPs 12.8, 12.16, and 14.4).
Threshold:	Evidence of oil sheen on surface of water.
Corrective action:	Suspend operations and remedy the situation.
Responsible staff:	Sale administrator and field engineer.
Record of results:	Daily diaries of field inspectors.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

LTF Removal

Objective:	To minimize permanent effects of LTFs on the marine environment.
Desired result:	Apply mitigation measures by removing temporary LTF structures at completion of contract operations. (BMP 14.5. Other measures may be stipulated in LTF permits following Record of Decision.)
Measurement:	Enforcement of contract specifications or MOU agreements at completion of operations.
Threshold:	Removal of LTF is incomplete.
Corrective action:	Withhold release of performance bond until mitigations are in compliance with contract specifications.
Responsible staff:	Sale administrator and engineering representative.
Record of results:	Letter authorizing movement of sale operations.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Stream Buffers

Objective:	To ensure compliance with modified 1997 Forest Plan Riparian Standards and Guidelines and the Tongass Timber Reform Act.
Desired result:	Ensure that buffers are maintained as specified in modified 1997 Forest Plan Riparian Standards and Guidelines (RIP2, III, E and F), and per Tongass Timber Reform Act (BMPs 12.6, 12.7, and 13.15).
Measurement:	Spot-check 20 percent of all units near anadromous fish streams for compliance. Specialists will spot-check up to 20 percent of the units offered for sale each year.
Threshold:	Minimum buffers as specified in Forest Plan Riparian standards and guidelines and TTRA.
Corrective action:	Postpone implementation until minimum buffer widths are verified. Resolve among sale administrator, timber sale operator, and timber layout employees. If not resolvable at the field level, bring to District Ranger
Responsible staff:	Fisheries Specialist, Hydrologist, District timber layout and sale administration employees.
Record of results:	Sale layout cards for units and daily diaries of sale administrators.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Eagle Nesting Habitat

Objective:	To ensure Forest Service maintains minimum 330-foot buffers around eagle nest locations or minimizes impacts on nest locations with approved variances.
Desired result:	Protect eagle nest locations.
Measurement:	During sale implementation activities, observe eagle activities in nests close to logging camps and major road crossings, especially where variances to 330-foot minimum buffers were negotiated.
Threshold:	Management activities encroach on 330-foot minimum buffers or on trees with approved variances, causing eagle nesting to cease.
Corrective action:	If it appears eagle nesting is disrupted because of management activities, consult with the U. S. Fish and Wildlife Service (USFWS) to resolve potential problem.
Responsible staff:	Sale administrator and wildlife specialist.
Record of results:	Daily diaries of sale administrators, and memos of wildlife specialists recording findings at nest sites.
Annual cost:	Ongoing activity for sale administration. Site visits by wildlife specialists would cost an estimated $4,000 per year during active logging operations.
Extra FTE needs:	None.

Beach Fringe, Estuary Fringe, and Riparian Habitat

Objective:	Avoid extending harvest units into wetlands, beach or estuary fringe habitat (BMP 12.5). Ensure that travel corridors are protected.
Desired result:	Avoid loss of wildlife habitat or other effects beyond the parameters of the preferred alternative.
Measurement:	Unit cards identify unit locations, noting if they are adjacent to protected travel corridors, estuaries, or beach fringes. If so noted, the units must not be enlarged in a manner that adversely affects these wildlife features. All units (20 percent) laid out each year will be checked for conformance with unit card design guides.
Threshold:	More than 10 percent of the spot-checked units deviate from wildlife concerns stated on cards.
Corrective action:	If landing or boundary locations are not feasible, the layout employee will contract a wildlife specialist and resolve desired changes at the time of layout. If still unresolved, bring to the District Ranger.
Responsible staff:	District timber layout and sale administration employees.
Record of results:	As-laid-out unit cards, as part of the pre-sale files.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Heritage Resources

Objective:	To ensure cultural resources are protected.
Desired result:	Resolve conflicts between goal of protecting cultural resources and need for timber harvest, road construction, and LTF construction to conform to the National Historic Preservation Act as amended. Confirm that cultural resources are protected before operations begin.
Measurement:	Evaluate impacts on cultural resources discovered after the start of timber harvest, road building, or LTF construction.
Threshold:	Evidence of cultural materials discovered during operations.
Corrective action:	Cultural resources specialist will ensure known sites are protected prior to implementing any land-disturbing activities. In the event of future discoveries, suspend activities until mitigation and protection measures are designated jointly by cultural resources staff, State Historic Preservation Officer, the Advisory Council on Historic Preservation, and District Ranger.
Responsible staff:	Sale layout employees, engineering and road design employees, and field inspectors of timber sale operations. Cultural resource specialist is available for field inspection as needed.
Record of results:	Record new discoveries in daily diaries of field inspectors. Cultural resource specialist will develop and maintain appropriate records for new discoveries brought to his or her attention.
Annual cost:	Ongoing work; no additional funding needed.
Extra FTE needs:	None.

Effectiveness Monitoring

Timber Restocking

Objective:	To ensure restocking occurs within minimum time frames stated in the NFMA.
Desired result:	Adequately restocked timber stands.
Measurement:	Stocking surveys at the first, third, or fourth year.
Evaluation:	Determination that stocking is adequate. Corrective action (i.e., planting) if natural regeneration is inadequate.
Responsible staff:	District staff.
Record of results:	Annual restocking report (NFMA).
Annual cost:	Ongoing business; no additional funding needed.
Extra FTE needs:	None.

Site Utilization

Objective:	To ensure timber growth on high productive sites is managed future fiber production.
Desired result:	On high site index sites, thin stands aged 15 to 20 years.
Measurement:	Conduct surveys of stands aged 10 to 12 years to identify and plan future thinning activities.
Evaluation:	Assess and document survey findings. Prioritize and program the best stands for thinning when they are 15 to 20 years old.
Responsible staff:	District employees.
Record of results:	Annual report of overall thinning and precommercial thinning (Supervisor's Office).
Annual cost:	Ongoing business; no additional funding needed.
Extra FTE needs:	None.

Post-Sale Road Use

Objective:	To determine if RMOs for post-sale use are reflected by actual use.
Desired result:	Use of road systems after harvesting conforms to guidelines. Effects of road use on resources do not exceed stands.
Measurement:	Random visits to beachheads from May to November.
Evaluation:	Determine if use if occurring, if RMOs are being met, and if vehicles are honoring road closures.
Responsible staff:	District timber staff, with assistance from recreation specialist as needed.
Record of results:	Memo documenting findings of random visits (completed after each visit).
Annual cost:	$2,500.
Extra FTE needs:	0.1 FTE.

Water Quality and Water Uses

Objective:	To ensure that management activities maintain water quality and protect beneficial water uses, particularly fish habitat.
Desired result:	To determine how well BMPs that are properly implemented protect water quality and water uses.
Measurements:	Field monitoring of road drainage structure and erosion, BMP effectiveness, LTFs, stream buffer strips for stability and effectiveness, Class III stream protection and yarding disturbance, and landslides as per annual Tongass National Forest BMP effectiveness monitoring.
Evaluation:	Assess and document survey findings. Determine mitigating actions if necessary or practical.
Responsible staff:	SO and District staffs.
Annual cost:	LTF, $2,000; road drainage, $3,000; buffer strip stabilization, $500; Class III stream and yarding, $1,000; BMP effectiveness, $1,500; landslide, $1,000; buffer strip effectiveness will be done outside Project Area (Tongass National Forest Monitoring Plan).
Extra FTE needs:	LTF, 0.1 FTE; road drainage, 0.1 FTE; buffer strip stabilization, 0.1 FTE; Class III stream and yarding 0.1 FTE; BMP effectiveness, 0.1 FTE; landslide, 0.1 FTE.

Validation Monitoring

Uneven-aged Management

Objective:	To determine the effectiveness and feasibility of uneven-aged management silvicultural prescriptions.
Desired result:	Residual trees are still standing and remain windfirm. Adequate regeneration is occurring in harvested openings. Slope stability is maintained.
Measurement:	Document the effect of opening the stand on the windfirmness of residual trees and on slope stability. Measure stocking and species composition of regeneration at third or fourth year, and at approximately year 10.
Evaluation:	Evaluate the effectiveness of group selection and single tree selection as viable silvicultural prescriptions. Determine whether stocking in groups and created openings is adequate. Prescribe planting if natural regeneration is inadequate. Determine whether uneven-aged systems are appropriate to meet the stated unit-specific objectives such as protection of unstable slopes, visual resources, wildlife and fish habitat, etc.
Responsible staff:	District Silviculture.
Record of results:	Memos documenting findings of visits.
Annual cost:	Ongoing business in conjunction with stocking and thinning surveys; no additional funding needed.
Extra FTE needs:	None.

Appendix D

Road Management Objectives (RMOs)

Road Management Objectives

Road Management Definitions and Terminology used in RMO Summary Tables

Road Status

- **E:** Existing road.
- **E(R):** Existing Road, scheduled for reconstruction.
- **P:** Proposed for construction.

Service Life (The length of time a facility is expected to provide a specified service.)

- **Long-term:** Service life of at least ten years.
- **Intermittent:** Operated for periodic service, and closed for more than one year between periods of use.

Service Level (Based on significant traffic characteristics and operating conditions for a road. Reflects factors such as speed, travel time, traffic interruptions, freedom to maneuver, safety, driver comfort, convenience, and operating costs.)

- **C:** Traffic flow is slowed by road condition. Traffic volumes are frequently controlled as the capacity is reached. Accommodates mixed traffic (all vehicle types). Meets minimum safety requirements. Topographic features generally dictate alignment. Travel efficiency is traded for lower construction costs. Road surface may not be stable under all traffic or weather conditions during the normal use season.
- **D:** Traffic flow is slow or may be blocked by an activity. Traffic volumes are intermittent and usually controlled; volume is limited to that associated with the single purpose (e.g., timber harvest). Not designed for mixed traffic. Need for safety protection is minimized by slow speeds and strict traffic controls. Alignment is dictated by topography. Road surface is rough and irregular.

Functional Classification (The way in which a road services land and resource management needs and the character of service it provides.)

- **A:** Arterial road. Provides service to large land areas and usually connects with other arterial roads or public highways. (Due to the remoteness of the Indian River Timber Sale(s) Project Area, and the fact that the road systems planned for the area are small and not interconnected, no roads are classified as arterials.)
- **C:** Collector road. Serves smaller land areas than an arterial road. Usually connects arterial roads to local roads or terminal facilities.
- **L:** Local road. Connects terminal facilities with other local, collector, or arterial roads, and public highways. Usually local roads are for a single purpose, such as timber harvest.

Post-harvest Maintenance Level (Defines the level of service provided by, and maintenance required for, a specific road after harvest.)

- **Level 1:** Normally assigned to intermittent service roads during the time they are closed to vehicular traffic. In the Indian River Timber Sale(s) RMO summary tables, this level also applies to short-term roads after the purpose for which they were constructed is completed. At this level, drainage structures are removed, the roadbed is waterbarred, and basic custodial maintenance is performed to keep damage to adjacent resources at an acceptable level and to perpetuate the road to facilitate future management activities.
- **Level 2:** Assigned to roads needed by high clearance vehicles between periods of harvest. Planned post-harvest vehicle traffic in the Indian River Timber Sale(s) Project Area is expected to be either high clearance vehicles (HCV) or all-terrain vehicles (ATV), to accomplish administrative and recreation access objectives. Roads will be logged out and brushed as necessary to provide passage for ATVs. The road prism will be maintained to provide for passage of high clearance vehicles. Barricades will be placed at the entrance of each road maintained at this level, for ATV access, to effectively block vehicles greater than 50" in width.

Post Harvest Access Needs and Traffic Strategies:

1) **Future Commercial Timber Volume** (Is there additional timber that this road access for which it will be needed in the future?)

- **Yes:** Additional timber exists for which this road will be needed in the future.
- **No:** No additional timber exists for which this road will be needed in the future.

2) **Silviculture/Administration** (Access needed to perform administration or post-sale silviculture practices, and method of access.)

- **HCV:** High clearance vehicle, pickup-type 4-wheel drive.
- **ATV:** All terrain vehicle, smaller 4-wheel or motorcycle.

3) **Post-harvest Public/Recreation Traffic Strategies** (Describes methods employed on forest development roads to control traffic. Used to prevent damage to the roadway, to abate unsafe traffic conditions, or to control use to meet other specific management direction such as protecting wildlife habitat or achieving semi-primitive recreation objectives.)

- **Encourage:** Encourage public use by means of appropriate signing, public notification, and active maintenance of the road prism.
- **Accept:** Public use is allowed but not encouraged, while road is maintained for administrative access.
- **Discourage:** Public access is discouraged by means of allowing alder growth at road entrance, non-removal of blowdown, or road prism deterioration within acceptable environmental limits. Road may also be signed to discourage use. Example: "Not Maintained for Public Traffic."
- **Eliminate:** Road is physically blocked to after sale traffic. Where prescribed for long-term intermittent roads, this strategy is achieved by means of placement of impassable barricades at road entrances. On short-term roads, removal of drainage structures effectively block traffic.
- **Prohibit:** Public access is prohibited by a road order (i.e., CFR closure). Implementation of this strategy on remote road systems such as the Indian River Timber Sale(s) Project Area may require the installation of gates, in addition to public notification and appropriate signing.

Post-harvest Resource Concerns (Specific road management concerns noted by resource specialists during planning process. See Road Cards in Appendix I, for mitigation measures related to concerns.)

- **Hydrology/Soils**
- **Wildlife**
- **Subsistence**
- **Fish and fish habitat**

ROAD MANAGEMENT OBJECTIVES

Alternative B

VCU	ROAD NUMBER	ROAD MILES	ROAD STATUS	SERVICE LIFE	SERVICE LEVEL	FUNCT. CLASS	POST-HARVEST MAINT. LEVEL	POST-HARVEST ACCESS NEEDS/TRAFFIC STRATEGIES			POST - HARVEST RESOURCE CONCERNS (SEE ROAD CARDS)			
								FUTURE COMML. VOL.	SILVIC/ ADMIN	PUBLIC/ RECREATION	HYDRO/ SOILS	W/L	SUB-SIS.	FISH
2160	7500	4.97	E	LONG-TERM	C	C	2	YES	HCV	ENCOURAGE			X	
2160	7502	1.82	E	LONG-TERM	C	C	2	YES	HCV	ENCOURAGE				X
2160	7507	0.08	E	INTERMITTENT	D	L	1	NO		ACCEPT				
2160	7509	0.42	E	INTERMITTENT	D	L	1	NO		ACCEPT				
2160	75021	0.22	E	INTERMITTENT	D	L	1	NO		ACCEPT	X			
2160	7500	1.73	P	LONG-TERM	D	L	2	YES	HCV	ENCOURAGE				
2160	75007	1.76	P	INTERMITTENT	D	L	1	NO		ENCOURAGE	X			
2160	75021	0.54	P	INTERMITTENT	D	L	1	NO		ACCEPT	X			
2200	7500	9.61	E	LONG-TERM	C	C	3	YES		ENCOURAGE	X	X	X	
2200	7501	0.61	E	LONG-TERM	D	L	2	YES	HCV	ENCOURAGE	X			X
2200	75003	0.13	E	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				X
2200	75004	0.60	E	INTERMITTENT	D	L	2	YES	HCV	ENCOURAGE	X			X
2200	75012	0.18	E	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				X
2200	7501	0.94	P	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				
2200	75003	0.54	P	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				
2200	75004	0.56	P	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				
2210	7502	0.76	P	INTERMITTENT	D	L	2	YES	HCV	ENCOURAGE				
2221	7502	3.52	E	LONG-TERM	C	C	2	YES		ENCOURAGE	X			X
2221	75028	0.12	E	INTERMITTENT	D	L	2	YES	HCV	ACCEPT				
2221	7502	0.94	P	INTERMITTENT	D	L	2	YES	HCV	ENCOURAGE				X
	Total Miles	30.05												

ROAD MANAGEMENT OBJECTIVES

Alternative C

VCU	ROAD NUMBER	ROAD MILES	ROAD STATUS	SERVICE LIFE	SERVICE LEVEL	FUNCT. CLASS	POST-HARVEST MAINT. LEVEL	POST-HARVEST ACCESS NEEDS/TRAFFIC STRATEGIES			POST - HARVEST RESOURCE CONCERNS (SEE ROAD CARDS)			
								FUTURE COMML. VOL.	SILVIC/ ADMIN	PUBLIC/ RECREATION	HYDRO/ SOILS	W/L	SUB-SIS.	FISH
2041	7500	0.16	P	SHORT-TERM	D	L	1	YES	HCV	DISCOURAGE				
2160	7500	4.97	E	INTERMITTENT	C	C	2	YES	HCV	DISCOURAGE			X	
2160	7502	1.82	E	INTERMITTENT	D	C	2	YES	HCV	DISCOURAGE				
2160	7507	0.08	E	SHORT-TERM	D	L	1	NO		DISCOURAGE				
2160	75021	0.22	E	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	7500	2.05	P	INTERMITTENT	D	L	2	YES	HCV	DISCOURAGE	X			
2160	7508	1.02	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				X
2160	75007	1.81	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	75021	0.54	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	750071	0.99	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2200	7500	9.61	E	INTERMITTENT	C	C	2	YES	HCV	DISCOURAGE	X	X	X	
2200	7501	0.61	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE	X			X
2200	75004	0.60	E	INTERMITTENT	D	L	1	NO		DISCOURAGE	X			X
2200	75012	0.18	E	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				X
2200	7501	0.94	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				
2200	75004	0.56	P	SHORT-TERM	D	L	1	NO		DISCOURAGE				
2221	7502	3.52	E	INTERMITTENT	D	C	2	YES	HCV	DISCOURAGE				X
2221	7502	0.27	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE	X			
2221	75028	0.12	E	SHORT-TERM	D	L	1	NO		DISCOURAGE				X
2221	75028	0.80	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			X
	Total Miles	30.87												

ROAD MANAGEMENT OBJECTIVES

Alternative D

VCU	ROAD NUMBER	ROAD MILES	ROAD STATUS	SERVICE LIFE	SERVICE LEVEL	FUNCT. CLASS	POST-HARVEST MAINT. LEVEL	POST-HARVEST ACCESS NEEDS/TRAFFIC STRATEGIES			POST - HARVEST RESOURCE CONCERNS (SEE ROAD CARDS)			
								FUTURE COMML. VOL.	SILVIC/ ADMIN	PUBLIC/ RECREATION	HYDRO/ SOILS	W/L	SUB-SIS.	FISH
2041	7500	0.16	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE		X		
2160	7500	4.97	E	INTERMITTENT	D	C	1	YES	ATV	DISCOURAGE			X	X
2160	7502	1.82	E	INTERMITTENT	D	C	1	YES	ATV	DISCOURAGE	X			X
2160	7507	0.08	E	SHORT-TERM	D	L	1	NO		DISCOURAGE				
2160	75021	0.22	E	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	7500	2.05	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2160	7508	1.02	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				X
2160	75007	1.81	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	75021	0.54	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2160	750071	0.99	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			
2210	7502	0.76	P	INTERMITTENT	D	C	1	YES	ATV	DISCOURAGE	X			
2221	7502	3.52	E	INTERMITTENT	D	C	1	YES	ATV	DISCOURAGE	X	X		X
2221	75028	0.12	E	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				
2221	7502	0.94	P	INTERMITTENT	D	C	1	YES	ATV	DISCOURAGE		X		X
2221	75028	0.80	P	SHORT-TERM	D	L	1	NO		DISCOURAGE	X			X
	Total Miles	19.80												

ROAD MANAGEMENT OBJECTIVES

Alternative E

VCU	ROAD NUMBER	ROAD MILES	ROAD STATUS	SERVICE LIFE	SERVICE LEVEL	FUNCT. CLASS	POST-HARVEST MAINT. LEVEL	POST-HARVEST ACCESS NEEDS/TRAFFIC STRATEGIES			POST - HARVEST RESOURCE CONCERNS (SEE ROAD CARDS)			
								FUTURE COMML. VOL.	SILVIC/ ADMIN	PUBLIC/ RECREATION	HYDRO/ SOILS	W/L	SUB-SIS.	FISH
2160	7500	4.97	E	INTERMITTENT	D	C	1	YES	ATV	ELIMINATE			X	
2160	7502	1.82	E	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE				
2160	7507	0.08	E	SHORT-TERM	D	L	1	NO		ELIMINATE				
2160	75021	0.22	E	SHORT-TERM	D	L	1	NO		ELIMINATE	X			
2160	7500	1.73	P	SHORT-TERM	D	L	1	YES	ATV	ELIMINATE				
2160	7508	1.02	P	SHORT-TERM	D	L	1	YES	ATV	ELIMINATE				X
2160	75007	1.81	P	SHORT-TERM	D	L	1	NO		ELIMINATE	X			
2160	75021	0.54	P	SHORT-TERM	D	L	1	NO		ELIMINATE	X			
2160	750071	0.99	P	SHORT-TERM	D	L	1	NO		ELIMINATE	X			
2200	7500	9.61	E	INTERMITTENT	D	C	1	YES	HCV	DISCOURAGE	X	X	X	
2200	7501	0.61	E	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE	X			X
2200	75004	0.60	E	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE	X			X
2200	7501	0.94	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				
2200	75004	0.56	P	SHORT-TERM	D	L	1	YES	ATV	DISCOURAGE				
2221	7502	3.40	E	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE	X			X
2221	75023	0.21	E	SHORT-TERM	D	L	1	YES	ATV	ELIMINATE				
2221	75028	0.12	E	SHORT-TERM	D	L	1	YES	ATV	ELIMINATE				
2221	75028	0.80	P	SHORT-TERM	D	L	1	NO		ELIMINATE	X			X
	Total Miles	30.03												

ROAD MANAGEMENT OBJECTIVES

Alternative F

VCU	ROAD NUMBER	ROAD MILES	ROAD STATUS	SERVICE LIFE	SERVICE LEVEL	FUNCT. CLASS	POST-HARVEST MAINT. LEVEL	POST-HARVEST ACCESS NEEDS/TRAFFIC STRATEGIES			POST - HARVEST RESOURCE CONCERNS (SEE ROAD CARDS)			
								FUTURE COMML. VOL.	SILVIC/ ADMIN	PUBLIC/ RECREATION	HYDRO/ SOILS	W/L	SUB-SIS.	FISH
2041	7500	0.16	P	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE				
2160	7500	4.97	E	LONG-TERM	D	C	2	YES	ATV	DISCOURAGE			X	
2160	7502	1.82	E	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE				
2160	7507	0.08	E	INTERMITTENT	D	L	1	NO		ELIMINATE				
2160	75021	0.22	E	INTERMITTENT	D	L	1	NO		ELIMINATE	X			
2160	7500	2.05	P	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE				
2160	7508	1.02	P	INTERMITTENT	D	L	1	YES	ATV	ELIMINATE				X
2160	75007	1.81	P	INTERMITTENT	D	L	1	NO		ELIMINATE	X			
2160	75021	0.54	P	INTERMITTENT	D	L	1	NO		ELIMINATE	X			
2160	750071	0.99	P	INTERMITTENT	D	L	1	NO		ELIMINATE	X			
2200	7500	9.50	E	LONG-TERM	D	C	2	YES	ATV	DISCOURAGE	X	X	X	
2200	7501	0.61	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE	X			X
2200	75003	0.13	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				X
2200	75004	0.60	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE	X			X
2200	75012	0.18	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				X
2200	7501	0.94	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2200	75002	0.15	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2200	75003	0.54	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2200	75004	0.56	P	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2221	7502	3.52	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE	X			X
2221	75023	0.21	E	INTERMITTENT	D	L	1	YES	ATV	DISCOURAGE				
2221	75028	0.12	E	INTERMITTENT	D	L	1	NO		DISCOURAGE				
2221	75028	0.80	P	INTERMITTENT	D	L	1	NO		DISCOURAGE	X			X
	Total Miles	31.52												

Appendix E

Harvest Unit Detail Tables

Indian River Timber Sale
Alternative B

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Group Selection	0.20	62
1610	14.2	Helicopter	Overstory Removal	0.50	96
2220	31.9	Helicopter	Clearcut w/Green Tree Retention	0.95	494
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.95	152
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.95	273
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.95	1219
3010	13.1	Helicopter	Group Selection	0.20	45
3212	2.3	Helicopter	Patch Clearcut	0.35	15
3221	4.4	Cable	Clearcut w/Green Tree Retention	0.90	113
3221	28.6	Cable	Clearcut w/Green Tree Retention	0.95	775
3222	46.9	Cable	Patch Clearcut	0.35	388
3520	15.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	283
3520	15.1	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	285
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	682
3610	4.7	Cable	Clearcut w/Green Tree Retention	0.90	92
3610	21.0	Cable	Clearcut w/Green Tree Retention	0.95	434
4120	58.2	Helicopter	Clearcut w/Green Tree Retention	0.95	1010
4420	38.2	Cable	Clearcut w/Green Tree Retention	0.95	1049
4440	19.0	Helicopter	Patch Clearcut	0.35	136
5010	14.1	Helicopter	Overstory Removal	0.70	180
5011	16.8	Shovel	Overstory Removal	0.70	307
5020	29.7	Helicopter	Overstory Removal	0.70	275
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.95	772
5080	23.8	Helicopter	Overstory Removal	0.80	316
5220	34.6	Helicopter	Group Selection	0.20	120
5840	2.7	Helicopter	Overstory Removal	0.70	53
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.95	254
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
21010	16.1	Cable	Single Tree Selection	0.50	233
21310	1.3	Helicopter	Overstory Removal	0.50	19
21410	25.1	Cable	Patch Clearcut	0.20	145
21420	25.0	Helicopter	Group Selection	0.20	145
21511	17.6	Cable	Patch Clearcut	0.20	102
21520	23.5	Helicopter	Overstory Removal	0.50	340
21610	12.3	Helicopter	Single Tree Selection	0.40	136
21811	8,5	Helicopter	Group Selection	0.20	28
21820	51.9	Helicopter	Group Selection	0.20	206
21830	18.7	Helicopter	Clearcut w/Green Tree Retention	0.95	416
21840	43.0	Helicopter	Clearcut w/Green Tree Retention	0.95	1048
21910	11.7	Helicopter	Overstory Removal	0.50	105
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Overstory Removal	0.50	129
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	356
22140	57.5	Helicopter	Clearcut w/Green Tree Retention	0.95	996

Indian River Timber Sale
Alternative B

Arial	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61011	18.4	Helicopter	Group Selection	0.20	83
61012	9.7	Helicopter	Group Selection	0.20	36
61020	26.3	Helicopter	Group Selection	0.20	98
61030	34.9	Helicopter	Overstory Removal	0.70	567
61310	0.8	Cable	Clearcut w/Green Tree Retention	0.90	10
61310	11.0	Cable	Clearcut w/Green Tree Retention	0.95	151
61410	22.6	Cable	Clearcut w/Green Tree Retention	0.95	531
61510	29.6	Helicopter	Clearcut w/Green Tree Retention	0.95	732
62610	34.3	Helicopter	Group Selection	0.20	133
62611	19.9	Helicopter	Group Selection	0.20	144
62620	10.8	Helicopter	Group Selection	0.20	82
62630	15.3	Helicopter	Group Selection	0.20	116
62640	8.8	Helicopter	Group Selection	0.20	67
62650	44.8	Helicopter	Group Selection	0.20	182
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.95	506
62720	9.2	Cable	Clearcut w/Green Tree Retention	0.95	160
62730	12.2	Helicopter	Group Selection	0.20	40
62740	11.0	Helicopter	Group Selection	0.20	39
62810	32.1	Helicopter	Group Selection	0.20	115
62820	14.2	Helicopter	Group Selection	0.20	52
62830	9.9	Helicopter	Group Selection	0.20	34
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.95	95
62850	19.6	Helicopter	Group Selection	0.20	71
62860	13.7	Helicopter	Group Selection	0.20	50
63110	15.8	Helicopter	Group Selection	0.20	58
63120	9.4	Helicopter	Group Selection	0.20	34
63520	6.2	Cable	Patch Clearcut	0.20	27
63820	50.5	Helicopter	Group Selection	0.20	175
63840	28.2	Helicopter	Clearcut w/Green Tree Retention	0.95	773
63850	38.7	Helicopter	Clearcut w/Green Tree Retention	0.95	935
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.95	244
63940	9.2	Helicopter	Group Selection	0.20	28
63960	12.3	Helicopter	Group Selection	0.20	42
63970	12.7	Helicopter	Group Selection	0.20	56
63971	11.9	Helicopter	Group Selection	0.20	63
64010	12.4	Helicopter	Clearcut w/Green Tree Retention	0.95	206
64110	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64110	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	299
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.95	404
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.95	164
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64530	2.9	Helicopter	Clearcut w/Green Tree Retention	0.95	45
Total	1,821.3			Total	23,550

Indian River Timber Sale
Alternative C

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.95	273
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.95	1219
3112	4.6	Cable	Clearcut w/Green Tree Retention	0.90	72
3112	17.8	Cable	Clearcut w/Green Tree Retention	0.95	293
3221	4.4	Cable	Clearcut w/Green Tree Retention	0.90	113
3221	28.6	Cable	Clearcut w/Green Tree Retention	0.95	775
3222	46.9	Cable	Patch Clearcut	0.35	388
3520	15.8	Cable/Helicopter	Clearcut w/Green Tree retention	0.90	283
3520	15.1	Cable/Helicopter	Clearcut w/Green Tree retention	0.95	285
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	682
3610	4.7	Cable	Clearcut w/Green Tree Retention	0.90	92
3610	21.0	Cable	Clearcut w/Green Tree Retention	0.95	434
4011	5.2	Shovel	Single Tree Selection	0.20	38
4012	9.2	Helicopter	Single Tree Selection	0.20	53
4120	58.2	Helicopter	Clearcut w/Green Tree Retention	0.95	1010
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.95	254
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
20812	4.6	Helicopter	Overstory Removal	0.70	59
20910	8.5	Helicopter	Patch Clearcut	0.50	56
21010	8.2	Cable	Clearcut w/Green Tree Retention	0.90	213
21010	7.9	Cable	Clearcut w/Green Tree Retention	0.95	218
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Cable	Clearcut w/Green Tree Retention	0.95	483
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.95	645
21610	12.3	Helicopter	Single Tree Selection	0.40	136
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.95	976
21840	43.0	Helicopter	Clearcut w/Green Tree Retention	0.95	1048
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.95	201
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	356
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.95	416
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.95	74
60420	22.1	Cable	Clearcut w/Green Tree Retention	0.95	700
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.95	120
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.95	79
61011	18.4	Helicopter	Patch Clearcut	0.40	165
61012	9.7	Helicopter	Patch Clearcut	0.40	73
61020	26.3	Helicopter	Group Selection	0.20	98
61030	16.0	Cable	Clearcut w/Green Tree Retention	0.90	333
61030	18.9	Cable	Clearcut w/Green Tree Retention	0.95	417

Indian River Timber Sale
Alternative C

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	0.8	Cable	Clearcut w/Green Tree Retention	0.90	10
61310	11.0	Cable	Clearcut w/Green Tree Retention	0.95	151
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.95	29
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.95	531
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.95	732
62610	34.3	Cable	Overstory Removal	0.80	530
62611	0.4	Shovel	Clearcut w/Green Tree Retention	0.90	13
62611	19.5	Shovel	Clearcut w/Green Tree Retention	0.95	671
62620	10.8	Shovel	Single Tree Selection	0.20	82
62630	15.3	Shovel	Single Tree Selection	0.20	116
62640	3.4	Cable	Clearcut w/Green Tree Retention	0.90	117
62640	5.4	Cable	Clearcut w/Green Tree Retention	0.95	193
62650	5.3	Cable	Clearcut w/Green Tree Retention	0.90	97
62650	39.5	Cable	Clearcut w/Green Tree Retention	0.95	760
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.95	506
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.95	192
62810	1.8	Helicopter	Clearcut w/Green Tree Retention	0.90	28
62810	30.3	Helicopter	Clearcut w/Green Tree Retention	0.95	501
62820	14.2	Helicopter	Patch Clearcut	0.40	103
62840	5.5	Helicopter	Clearcut w/Green Tree Retention	0.95	95
62850	19.6	Helicopter	Patch Clearcut	0.40	143
62860	1.0	Helicopter	Clearcut w/Green Tree Retention	0.90	17
62860	12.7	Helicopter	Clearcut w/Green Tree Retention	0.95	219
63110	11.1	Shovel	Clearcut w/Green Tree Retention	0.90	182
63110	4.7	Shovel	Clearcut w/Green Tree Retention	0.95	80
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Removal	0.95	324
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.95	832
63850	38.7	Helicopter	Clearcut w/Green Tree Retention	0.95	935
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.95	244
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.95	198
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.95	270
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	302
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.95	206
64020	64.5	Helicopter	Group Selection	0.20	193
64110	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64110	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	299
64210	28.3	Helicopter	Overstory Removal	0.90	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.95	404
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.95	164
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64530	2.9	Helicopter	Clearcut w/Green Tree Retention	0.95	45
65013	8.4	Helicopter	Clearcut w/Green Tree Retention	0.90	159
65013	4.3	Helicopter	Clearcut w/Green Tree Retention	0.95	91
65020	28.0	Cable	Clearcut w/Green Tree Retention	0.90	430
65020	34.8	Cable	Clearcut w/Green Tree Retention	0.95	564
Total	1,780.5			Total	28,283

Indian River Timber Sale
Alternative D

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
4120	58.2	Helicopter	Clearcut w/Green Tree Retention	0.95	1010
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.95	254
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.70	246
20812	4.6	Helicopter	Overstory Removal	0.70	59
20910	8.5	Helicopter	Patch Clearcut	0.50	56
21010	8.2	Cable	Clearcut w/Green Tree Retention	0.90	213
21010	7.9	Cable	Clearcut w/Green Tree Retention	0.95	218
21100	10.0	Helicopter	Group Selection	0.20	58
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Cable	Clearcut w/Green Tree Retention	0.95	483
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.95	645
21610	12.3	Helicopter	Single Tree Selection	0.40	136
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.95	976
21840	43.0	Helicopter	Clearcut w/Green Tree retention	0.95	1048
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.95	201
22010	26.0	Helicopter	Overstory Removal	0.50	229
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	356
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.95	416
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.95	74
60420	22.1	Cable	Clearcut w/Green Tree Retention	0.95	700
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.95	120
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.95	79
61011	18.4	Helicopter	Patch Clearcut	0.40	165
61012	9.7	Helicopter	Patch Clearcut	0.40	73
61020	26.3	Helicopter	Group Selection	0.20	98
61030	16.0	Cable	Clearcut w/Green Tree Retention	0.90	333
61030	18.9	Cable	Clearcut w/Green Tree Retention	0.95	417
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	0.8	Cable	Clearcut w/Green Tree Retention	0.90	10
61310	11.0	Cable	Clearcut w/Green Tree Retention	0.95	151
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.95	29
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.95	531
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.95	732
62610	34.3	Cable	Clearcut w/Green Tree Retention	0.95	630
62611	0.4	Shovel	Clearcut w/Green Tree Retention	0.90	13
62611	19.5	Shovel	Clearcut w/Green Tree Retention	0.95	671
62620	10.8	Shovel	Single Tree Selection	0.20	82
62630	15.3	Shovel	Single Tree Selection	0.20	116
62640	3.4	Cable	Clearcut w/Green Tree Retention	0.90	117

Indian River Timber Sale
Alternative D

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
62640	5.4	Cable	Clearcut w/Green Tree Retention	0.95	193
62650	5.3	Cable	Clearcut w/Green Tree Retention	0.90	97
62650	39.5	Cable	Clearcut w/Green Tree Retention	0.95	760
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.95	506
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.95	192
62810	1.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	28
62810	30.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	501
62820	14.2	Cable	Patch Clearcut	0.40	103
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.95	95
62850	19.6	Cable	Patch Clearcut	0.40	143
62860	1.0	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	17
62860	12.7	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	219
63110	11.1	Shovel	Clearcut w/Green Tree Retention	0.90	182
63110	4.7	Shovel	Clearcut w/Green Tree Retention	0.95	80
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.95	324
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.95	832
63850	38.7	Helicopter	Clearcut w/Green Tree Retention	0.95	935
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.95	244
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.95	198
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.95	270
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	302
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.95	206
64020	64.5	Helicopter	Group Selection	0.20	193
64110	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64110	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	299
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.95	404
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.95	164
64510	32.8	Helicopter	Overstory Removal	0.90	477
64530	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64530	2.9	Helicopter	Clearcut w/Green Tree Retention	0.95	45
65013	8.4	Helicopter	Clearcut w/Green Tree Retention	0.90	159
65013	4.3	Helicopter	Clearcut w/Green Tree Retention	0.95	91
65020	28.0	Cable	Clearcut w/Green Tree Retention	0.90	430
65020	34.8	Cable	Clearcut w/Green Tree Retention	0.95	564
Total	1,512.9			Total	23,441

Indian River Timber Sale
Alternative E

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Clearcut w/Green Tree Retention	0.95	295
1610	14.2	Helicopter	Patch Clearcut	0.35	68
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.95	152
2340	7.6	Helicopter	Clearcut w/Green Tree Retention	0.95	131
2710	45.9	Helicopter	Clearcut w/Green Tree Retention	0.95	634
3020	8.5	Helicopter	Clearcut w/Green Tree Retention	0.95	80
3222	46.9	Cable	Clearcut w/Green Tree Retention	0.95	1052
3520	15.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	283
3520	15.1	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	285
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	682
3610	4.7	Cable	Clearcut w/Green Tree Retention	0.90	92
3610	21.0	Cable	Clearcut w/Green Tree Retention	0.95	434
4011	5.2	Shovel	Single Tree Selection	0.20	38
4012	9.2	Helicopter	Single Tree Selection	0.20	53
4120	58.2	Helicopter	Clearcut w/Green Tree Retention	0.95	1010
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.95	772
5220	34.6	Helicopter	Group Selection	0.20	120
5410	19.5	Helicopter	Clearcut w/Green Tree Retention	0.95	318
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.95	254
20610	13.7	Helicopter	Overstory Removal	0.80	190
20710	10.7	Cable	Single Tree Selection	0.50	43
20810	21.8	Helicopter	Overstory Removal	0.80	281
20910	8.5	Helicopter	Overstory Removal	0.80	90
21010	16.1	Cable	Single Tree Selection	0.50	233
21610	12.3	Helicopter	Single Tree Selection	0.20	67
21711	1.0	Cable	Clearcut w/Green Tree Retention	0.95	17
21811	8.5	Cable	Clearcut w/Green Tree Retention	0.95	135
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.95	976
21840	43.0	Helicopter	Clearcut w/Green Tree Retention	0.95	1048
21910	11.7	Helicopter	Clearcut w/Green Tree Retention	0.95	201
22010	26.0	Helicopter	Overstory Removal	0.80	367
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut W/Green Tree Retention	0.95	356
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut W/Green Tree Retention	0.95	416
22230	3.5	Helicopter	Clearcut W/Green Tree Retention	0.95	74
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut W/Green Tree Retention	0.95	120
60910	10.5	Helicopter	Clearcut W/Green Tree Retention	0.95	79
61012	9.7	Helicopter	Group Selection	0.20	36
61020	26.3	Helicopter	Group Selection	0.20	98
61030	16.0	Cable	Clearcut W/Green Tree Retention	0.90	333
61030	18.9	Cable	Clearcut W/Green Tree Retention	0.95	417
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	0.8	Cable	Clearcut w/Green Tree Retention	0.90	10

Indian River Timber Sale
Alternative E

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
61310	11.0	Cable	Clearcut W/Green Tree Retention	0.95	151
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.95	29
61410	22.6	Shovel	Clearcut W/Green Tree Retention	0.95	531
61510	29.6	Cable	Clearcut W/Green Tree Retention	0.95	732
62650	5.3	Cable	Clearcut w/Green Tree Retention	0.90	97
62650	39.5	Cable	Clearcut W/Green Tree Retention	0.95	760
62710	20.9	Cable	Clearcut W/Green Tree Retention	0.95	506
62720	9.2	Cable	Clearcut w/Green Tree Retention	0.95	160
62730	12.2	Cable	Clearcut W/Green Tree Retention	0.95	192
62740	11.0	Cable	Clearcut W/Green Tree Retention	0.95	185
62820	14.2	Cable	Clearcut w/Green Tree Retention	0.95	246
62830	9.9	Helicopter	Overstory Removal	0.80	137
62840	5.5	Cable	Clearcut W/Green Tree Retention	0.95	95
62850	19.6	Cable	Clearcut W/Green Tree Retention	0.95	339
62860	1.0	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	17
62860	12.7	Cable/Helicopter	Clearcut W/Green Tree Retention	0.95	219
63110	11.1	Shovel	Clearcut W/Green Tree Retention	0.90	182
63110	4.7	Shovel	Clearcut w/Green Tree Retention	0.95	80
63120	9.4	Helicopter	Overstory Removal	0.80	137
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.95	324
63520	6.2	Cable	Patch Clearcut	0.20	27
63850	38.7	Helicopter	Clearcut w/Green Tree Retention	0.95	935
63920	14.1	Helicopter	Clearcut W/Green Tree Retention	0.95	244
63940	9.2	Cable	Clearcut W/Green Tree Retention	0.95	134
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.95	198
63970	12.7	Cable	Clearcut W/Green Tree Retention	0.95	270
63971	11.9	Cable/Helicopter	Clearcut W/Green Tree Retention	0.95	302
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.95	206
64020	64.5	Helicopter	Patch Clearcut	0.95	338
64110	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64110	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	299
64210	28.3	Helicopter	Overstory Removal	0.90	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.95	404
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.95	164
64510	32.8	Helicopter	Overstory Removal	0.90	477
64530	0.5	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64530	2.9	Helicopter	Clearcut w/Green Tree Retention	0.95	45
65013	9.4	Helicopter	Clearcut w/Green Tree Retention	0.90	159
65013	4.3	Helicopter	Clearcut w/Green Tree Retention	0.95	91
65020	28.0	Cable	Clearcut w/Green Tree Retention	0.90	430
65020	34.8	Cable	Clearcut w/Green Tree Retention	0.95	564
Total	1,595.5			Total	24,274

Indian River Timber Sale
Alternative F

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
1511	5.3	Helicopter	Single Tree Selection	0.20	30
1520	10.9	Shovel	Clearcut w/Green Tree Retention	0.95	295
1610	14.2	Helicopter	Patch Clearcut	0.35	68
2220	31.9	Helicopter	Clearcut w/Green Tree Retention	0.95	494
2310	9.7	Helicopter	Clearcut w/Green Tree Retention	0.95	152
2340	7.6	Helicopter	Clearcut w/Green Tree Retention	0.95	131
2810	13.6	Cable	Clearcut w/Green Tree Retention	0.95	273
2820	58.4	Helicopter	Clearcut w/Green Tree Retention	0.95	1219
3010	13.1	Helicopter	Clearcut w/Green Tree Retention	0.95	214
3020	8.5	Helicopter	Clearcut w/Green Tree Retention	0.95	80
3112	4.6	Cable	Clearcut w/Green Tree Retention	0.90	72
3112	17.8	Cable	Clearcut w/Green Tree Retention	0.95	292
3221	4.4	Cable	Clearcut w/Green Tree Retention	0.90	113
3221	28.6	Cable	Clearcut w/Green Tree Retention	0.95	775
3222	46.9	Cable	Clearcut w/Green Tree Retention	0.95	1052
3520	15.8	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	282
3520	15.1	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	285
3530	32.3	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	682
3610	4.7	Cable	Clearcut w/Green Tree Retention	0.90	92
3610	21.0	Cable	Clearcut w/Green Tree Retention	0.95	434
4011	5.2	Shovel	Single Tree Selection	0.20	38
4012	9.2	Helicopter	Single Tree Selection	0.20	53
4120	58.2	Helicopter	Clearcut w/Green Tree Retention	0.95	1010
4420	38.2	Cable	Clearcut w/Green Tree Retention	0.95	1049
4440	19.0	Helicopter	Clearcut w/Green Tree Retention	0.95	368
4620	60.9	Helicopter	Overstory Removal	0.80	1352
4710	10.7	Shovel	Single Tree Selection	0.20	143
4910	35.5	Helicopter	Clearcut w/Green Tree Retention	0.95	896
5040	14.1	Helicopter	Patch Clearcut	0.35	91
5011	16.6	Shovel	Patch Clearcut	0.35	154
5020	29.7	Helicopter	Patch Clearcut	0.35	137
5040	45.3	Helicopter	Clearcut w/Green Tree Retention	0.95	772
5040	23.8	Helicopter	Patch Clearcut	0.35	138
5220	34.6	Helicopter	Patch Clearcut	0.35	209
5040	19.5	Helicopter	Clearcut w/Green Tree Retention	0.95	318
5840	2.7	Helicopter	Overstory Removal	0.70	53
20510	16.6	Helicopter	Clearcut w/Green Tree Retention	0.95	254
20510	13.7	Helicopter	Overstory Removal	0.80	130
20710	10.7	Cable	Single Tree Selection	0.50	43
20510	21.8	Helicopter	Overstory Removal	0.80	281
20812	4.6	Helicopter	Overstory Removal	0.80	67
20510	8.5	Helicopter	Overstory Removal	0.80	90
21010	16.1	Cable	Single Tree Selection	0.50	233
21100	10.0	Helicopter	Patch Clearcut	0.35	101
21310	1.3	Helicopter	Patch Clearcut	0.35	13
21410	25.1	Helicopter	Patch Clearcut	0.35	254
21420	25.0	Helicopter	Patch Clearcut	0.35	253
21511	17.6	Helicopter	Clearcut w/Green Tree Retention	0.95	483

Indian River Timber Sale
Alternative F

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
21520	23.5	Helicopter	Clearcut w/Green Tree Retention	0.95	645
21610	12.3	Helicopter	Single Tree Selection	0.40	136
21811	8.5	Cable	Clearcut w/Green Tree Retention	0.95	135
21820	51.9	Cable	Clearcut w/Green Tree Retention	0.95	976
21840	43.0	Helicopter	Clearcut w/Green Tree Retention	0.95	1048
21910	11.7	Cable	Clearcut w/Green Tree Retention	0.95	201
22010	26.0	Helicopter	Overstory Removal	0.80	367
22110	14.2	Helicopter	Single Tree Selection	0.40	103
22120	26.4	Helicopter	Single Tree Selection	0.40	217
22130	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	356
22140	57.5	Helicopter	Single Tree Selection	0.40	420
22210	22.1	Helicopter	Clearcut w/Green Tree Retention	0.95	416
22230	3.5	Helicopter	Clearcut w/Green Tree Retention	0.95	74
60420	22.1	Cable	Clearcut w/Green Tree Retention	0.95	700
60710	58.8	Helicopter	Group Selection	0.20	247
60810	4.5	Helicopter	Clearcut w/Green Tree Retention	0.95	120
60910	10.5	Helicopter	Clearcut w/Green Tree Retention	0.95	79
61011	18.4	Helicopter	Patch Selection	0.40	165
61012	9.7	Helicopter	Group Selection	0.20	36
61020	26.3	Helicopter	Group Selection	0.20	98
61030	16.0	Cable	Clearcut w/Green Tree Retention	0.90	333
61030	18.9	Cable	Clearcut w/Green Tree Retention	0.95	417
61040	8.6	Helicopter	Overstory Removal	0.70	109
61310	0.8	Cable	Clearcut w/Green Tree Retention	0.90	10
61310	11.0	Cable	Clearcut w/Green Tree Retention	0.95	151
61311	1.6	Cable	Clearcut w/Green Tree Retention	0.95	29
61410	22.6	Shovel	Clearcut w/Green Tree Retention	0.95	531
61510	29.6	Cable	Clearcut w/Green Tree Retention	0.95	732
62610	34.3	Cable	Clearcut w/Green Tree Retention	0.95	630
62611	0.4	Shovel	Clearcut w/Green Tree Retention	0.90	13
62611	19.5	Shovel	Clearcut w/Green Tree Retention	0.95	671
62620	10.8	Shovel	Overstory Removal	0.80	330
62630	15.3	Shovel	Single Tree Selection	0.40	233
62650	5.3	Cable	Clearcut w/Green Tree Retention	0.90	97
62650	39.5	Cable	Clearcut w/Green Tree Retention	0.95	760
62710	20.9	Cable	Clearcut w/Green Tree Retention	0.95	506
62730	12.2	Cable	Clearcut w/Green Tree Retention	0.95	192
62810	32.1	Cable/Helicopter	Patch Clearcut	0.40	230
62820	14.2	Cable	Clearcut w/Green Tree Retention	0.95	246
62830	9.9	Helicopter	Overstory Removal	0.80	137
62840	5.5	Cable	Clearcut w/Green Tree Retention	0.95	95
62850	19.6	Cable	Single Tree Selection	0.40	143
62860	1.0	Cable/Helicopter	Clearcut w/Green Tree Retention	0.90	16
62860	12.6	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	218
63110	11.1	Shovel	Clearcut w/Green Tree Retention	0.90	182
63110	4.7	Shovel	Clearcut w/Green Tree Retention	0.95	80
63120	9.4	Helicopter	Overstory Removal	0.80	137

Indian River Timber Sale
Alternative F

Units	Acres	Harvest Method	Silvicultural Treatment	Percent Harvest (Volume)	Harvest Volume (MBF)
63510	18.8	Cable	Clearcut w/Green Tree Retention	0.95	324
63520	6.2	Cable	Overstory Removal	0.50	68
63820	50.5	Helicopter	Clearcut w/Green Tree Retention	0.95	832
63850	38.7	Helicopter	Clearcut w/Green Tree Retention	0.95	935
63920	14.1	Helicopter	Clearcut w/Green Tree Retention	0.95	244
63960	12.3	Cable	Clearcut w/Green Tree Retention	0.95	198
63970	12.7	Cable	Clearcut w/Green Tree Retention	0.95	270
63971	11.9	Cable/Helicopter	Clearcut w/Green Tree Retention	0.95	302
64010	12.4	Cable	Clearcut w/Green Tree Retention	0.95	206
64020	64.5	Helicopter	Patch Clearcut	0.35	338
64110	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64110	20.5	Helicopter	Clearcut w/Green Tree Retention	0.95	299
64210	28.3	Helicopter	Overstory Removal	0.80	390
64410	23.4	Cable	Clearcut w/Green Tree Retention	0.95	404
64420	9.4	Helicopter	Clearcut w/Green Tree Retention	0.95	164
64510	32.8	Helicopter	Overstory Removal	0.80	477
64530	0.4	Helicopter	Clearcut w/Green Tree Retention	0.90	6
64530	2.9	Helicopter	Clearcut w/Green Tree Retention	0.95	45
65013	8.4	Helicopter	Clearcut w/Green Tree Retention	0.90	159
65013	4.3	Helicopter	Clearcut w/Green Tree Retention	0.95	91
65020	28.0	Cable	Clearcut w/Green Tree Retention	0.90	430
65020	34.8	Cable	Clearcut w/Green Tree Retention	0.95	564
Total	2,261.3			Total	36,597

Appendix F

Subsistence

APPENDIX F

SUBSISTENCE

F-1. Regional Deer Demand as a Percentage of Deer Supply map.

F-2. Project Area Subsistence Harvest maps.

- A. Deer
- B. Salmon
- C. Finfish
- D. Marine Mammal
- E. Marine Invertebrate

F-3. Historical Clan Hunting Boundary maps.

- A. Angoon
- B. Hoonah

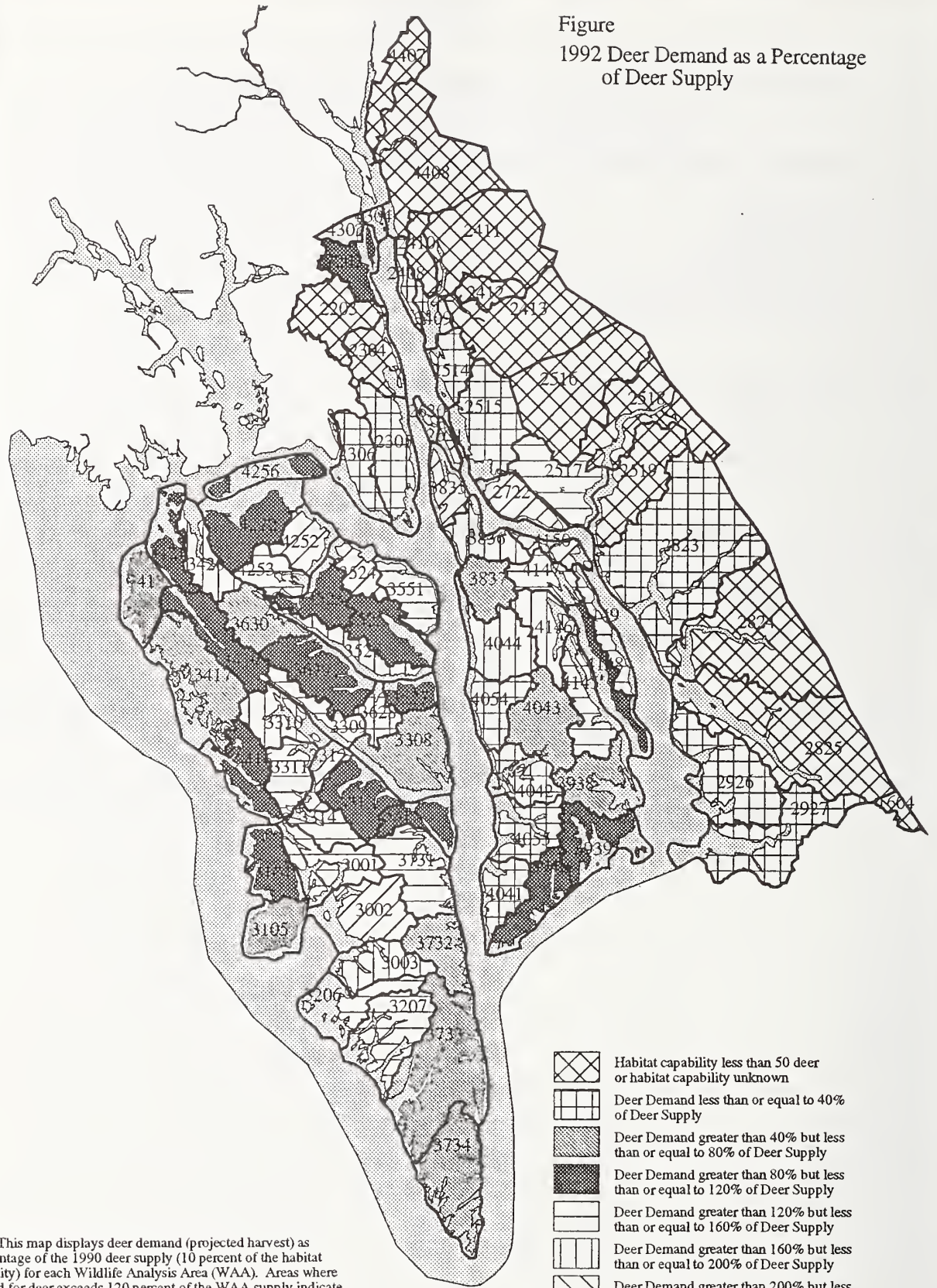
F-4. Community Subsistence Deer Hunting Area maps.

- A. Angoon
- B. Hoonah
- C. Tenakee Springs

F-5. Indian River Project Area Acres of Stem Exclusion 25 to 140 Years After Harvest.

F-6. Indian River Project Area Percent of Pre-harvest Old Growth Habitat in Stem Exclusion 25 to 140 Years After Harvest.

Figure
1992 Deer Demand as a Percentage of Deer Supply



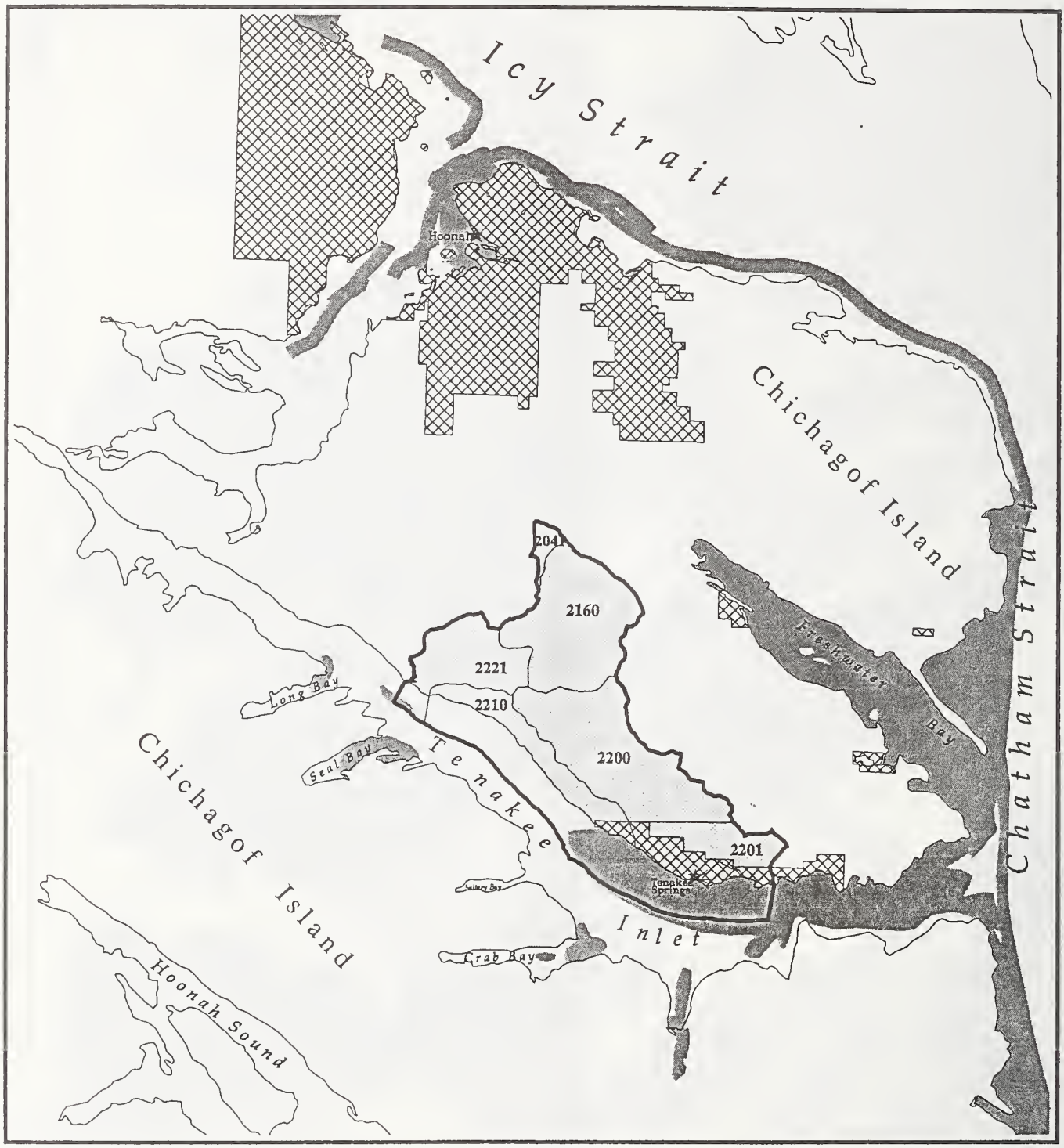
Note: This map displays deer demand (projected harvest) as a percentage of the 1990 deer supply (10 percent of the habitat capability) for each Wildlife Analysis Area (WAA). Areas where demand for deer exceeds 120 percent of the WAA supply indicate that existing deer habitat is not sufficient to sustain present harvest levels. Demand equals mean deer harvested by WAA for the years 1987-1992. Harvest data is from Alaska Dept. of Fish and Game (ADF&G) 1987–1992 deer hunter surveys; deer habitat capability estimates are from Tongass Land Management Plan Revision (TLMPR, 1991). Source: ADF&G Div. of Subsistence, Tongass National Forest, Chatham Area GIS.

Indian River Regional Subsistence Deer Harvest



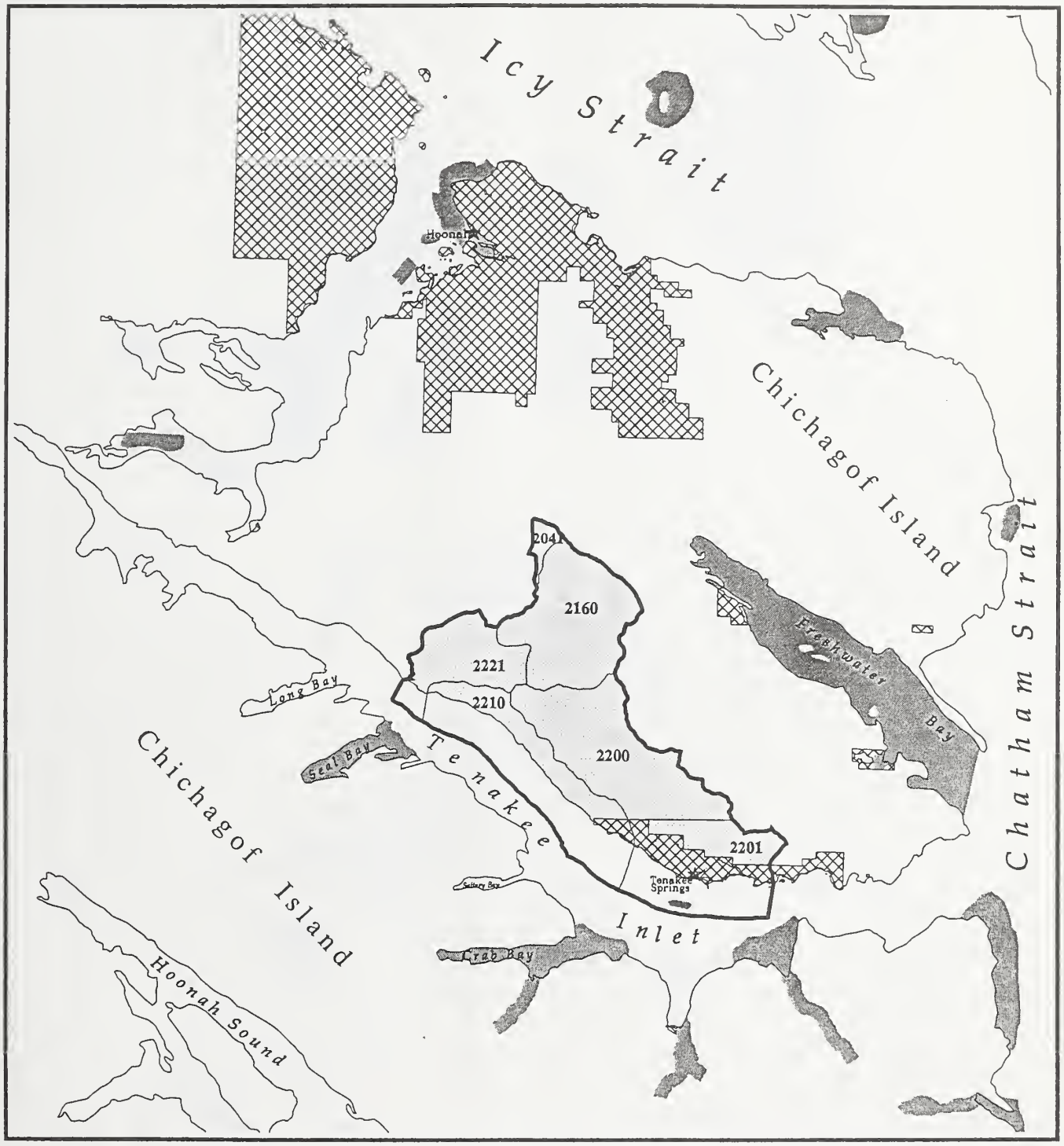
Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Salmon Harvest



Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Finfish Harvest



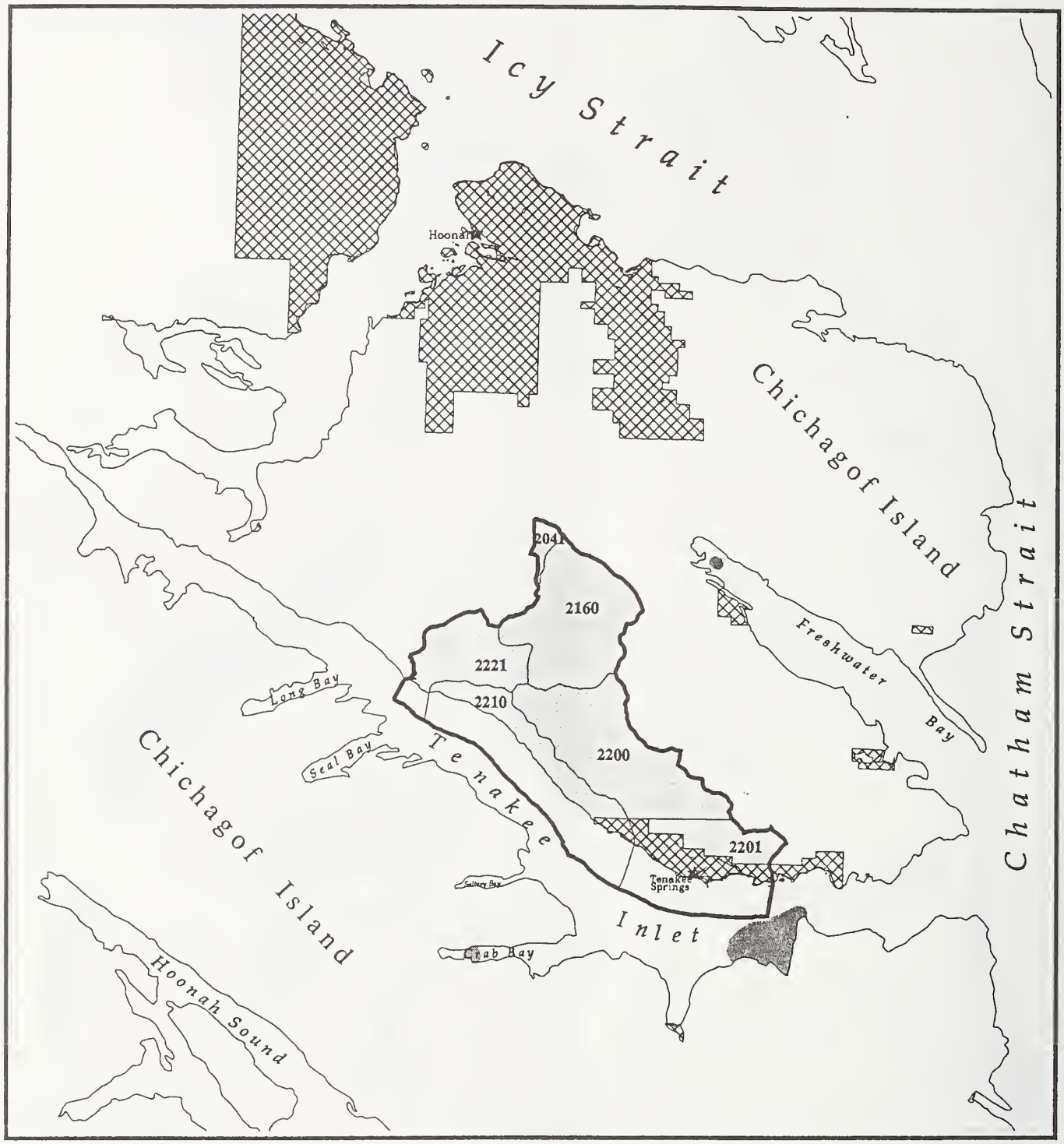
Project Boundary
Project Area
Other Ownership
Areas Where one or more Households Have ever Fished for Finfish

4 2 0 4 8
Scale in Miles

N W E S

Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Marine Mammal Harvest



Project Boundary
Project Area
Other Ownership
Areas Where one or more Households Ever Harvest Marine Mammals

4 2 0 4 8
Scale in Miles

N
W E
S

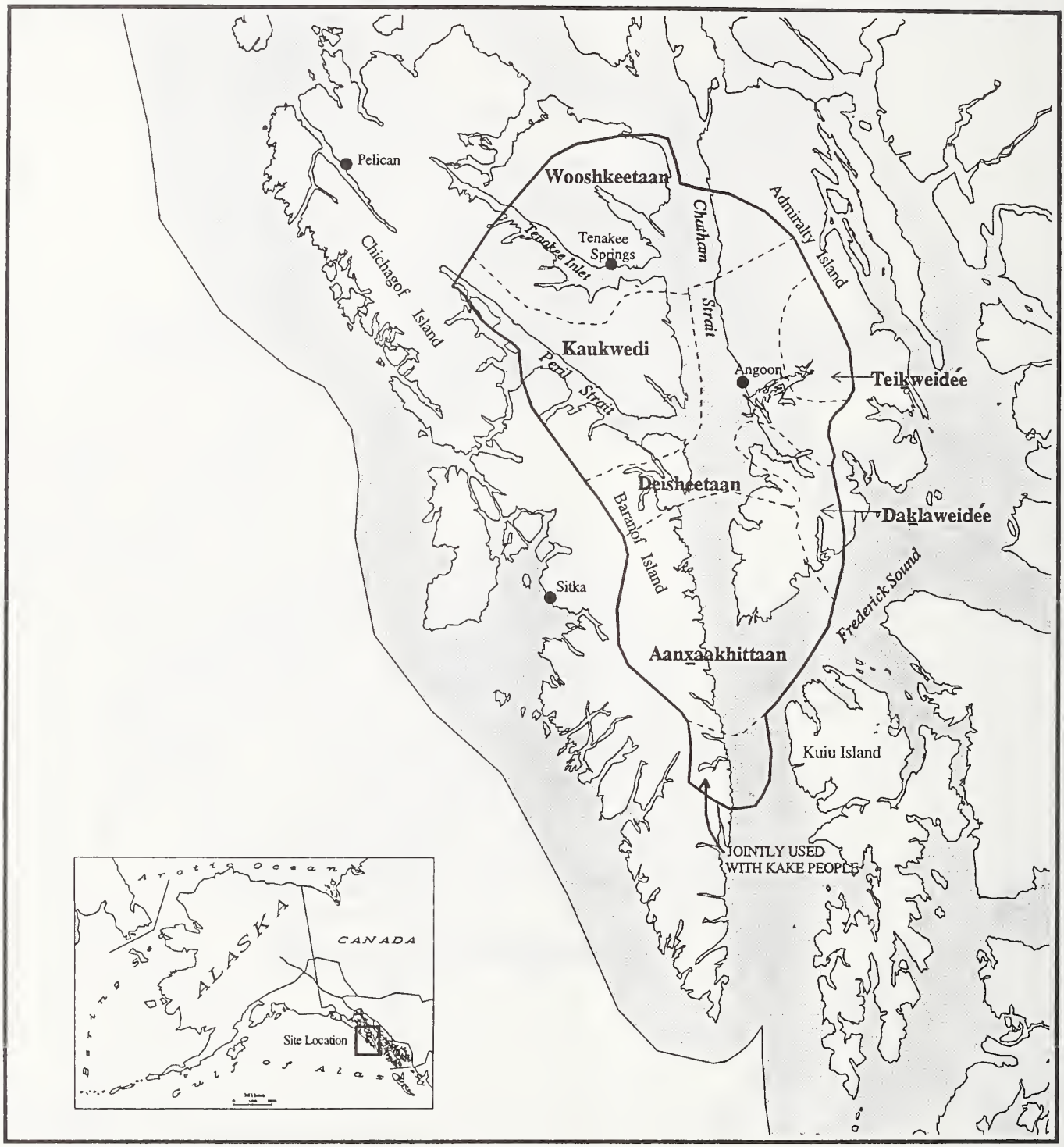
Source: TRUCS 1988 and Chatham Area GIS

Indian River Regional Subsistence Marine Invertebrate Harvest



Source: TRUCS 1988 and Chatham Area GIS

Historical Clan Hunting Boundaries of Angoon Tlingits



Territorial Boundary

Clan Boundary

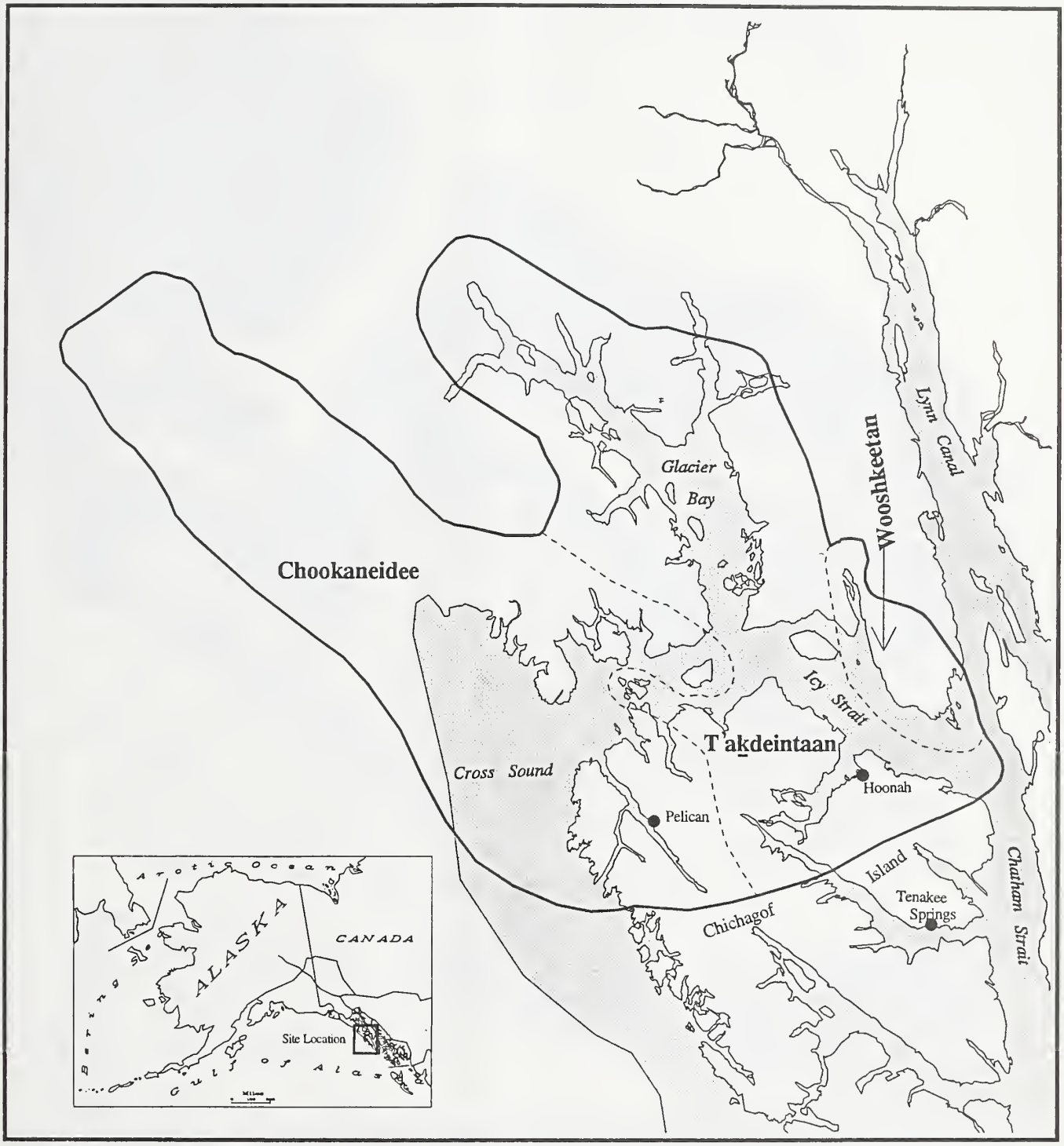
10 5 0 10 20

Scale in Miles

Source: Goldschmidt and Haas, 1946

Note: Clan name spelling from Sitka Native Education Program and N.Lawson, 1996

Historical Clan Ownership and Use Rights Boundaries of Hoonah Tlingit



Territorial Boundary

Clan Boundary

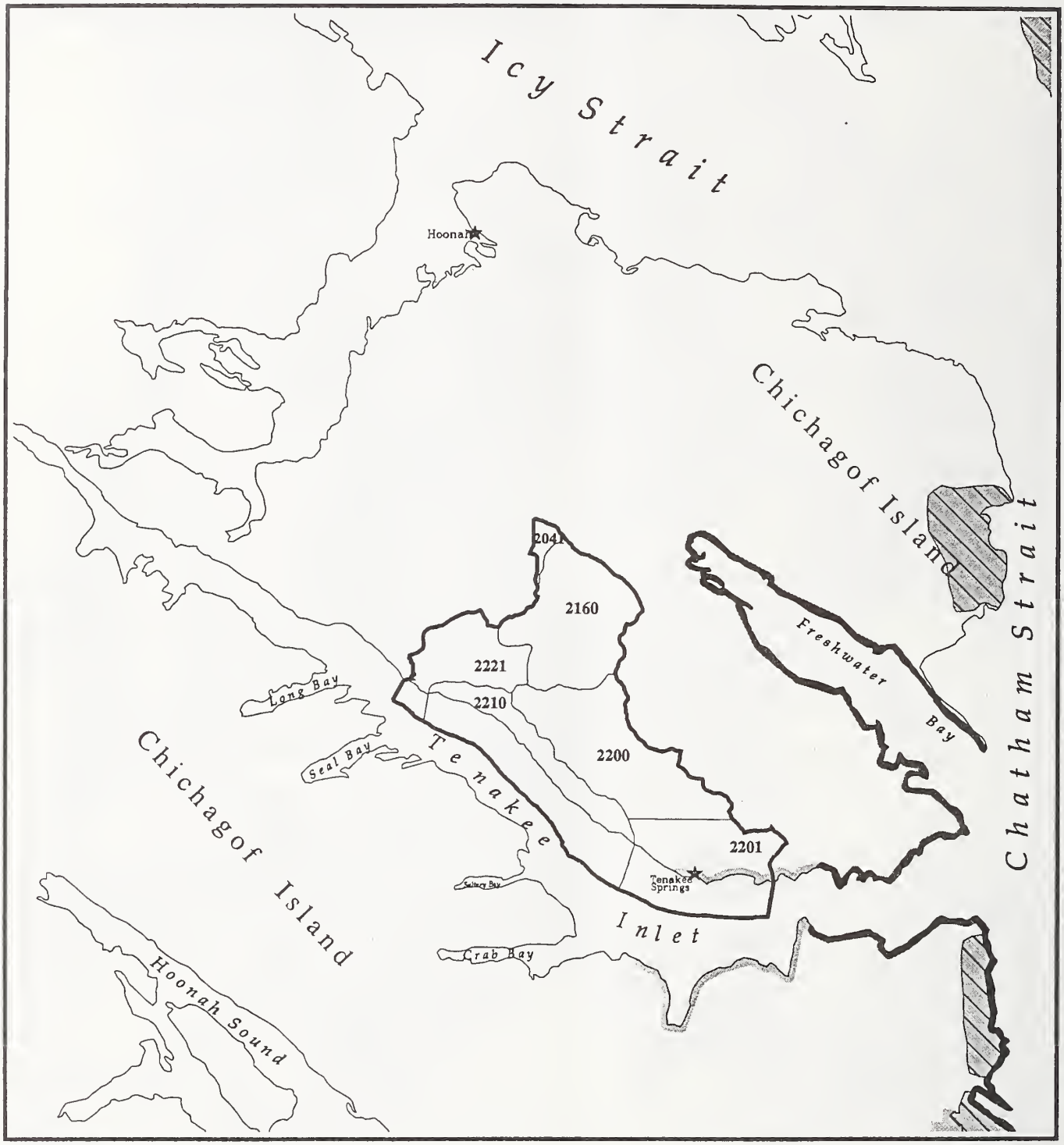
10 5 0 10 20

Scale in Miles

Source: Schroeder and Kookesh, 1990

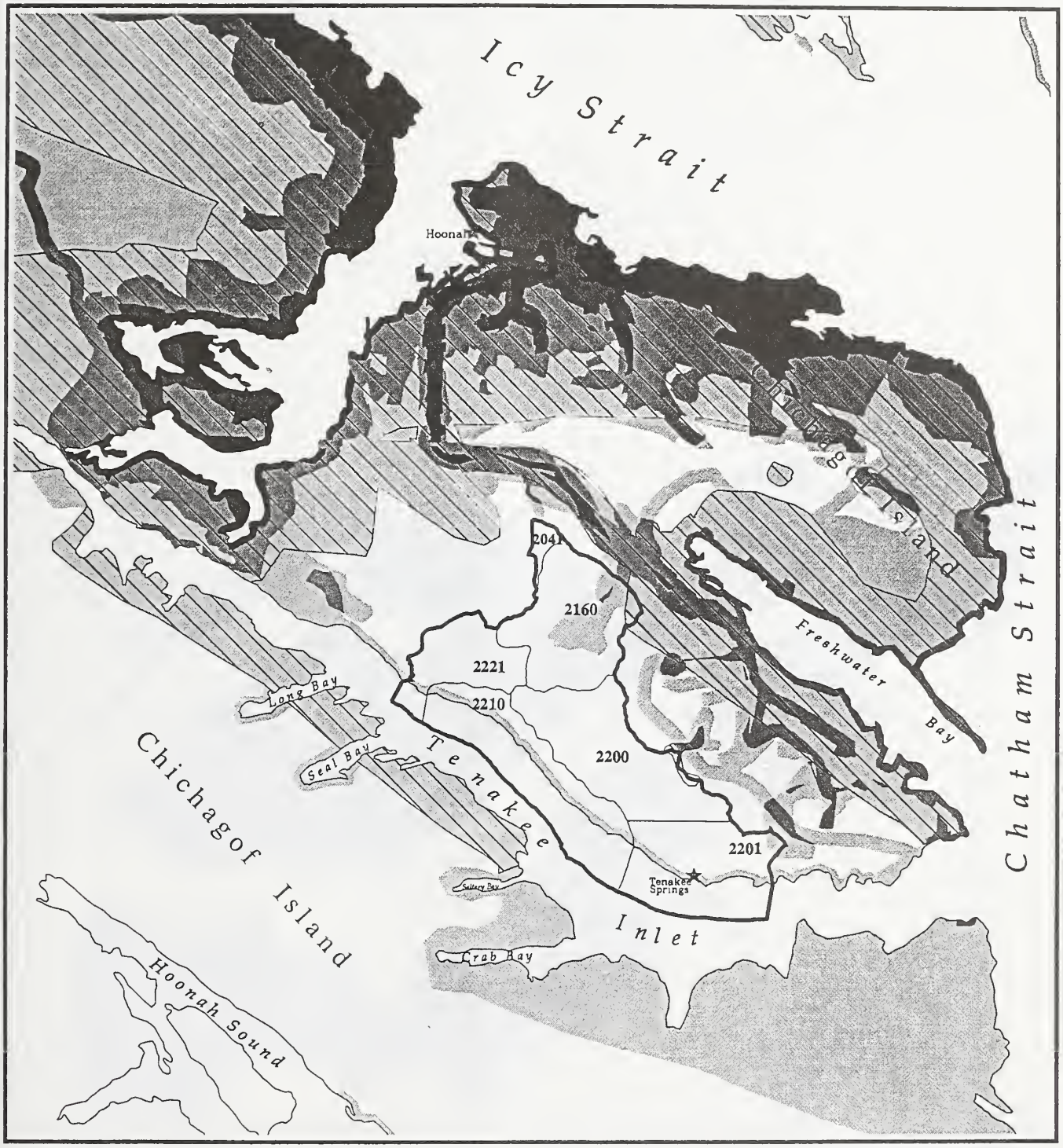
Adapted from Goldschmidt and Haas, 1946

Angoon Subsistence Deer Hunting Areas



Source: TRUCS 1988 and Chatham Area GIS

Hoonah Subsistence Deer Hunting Areas



1 to 5 Percent of households
6 to 15 Percent of households
16 to 25 Percent of households
Greater than 25 percent of households
Most reliable, most often used areas
Project Boundary

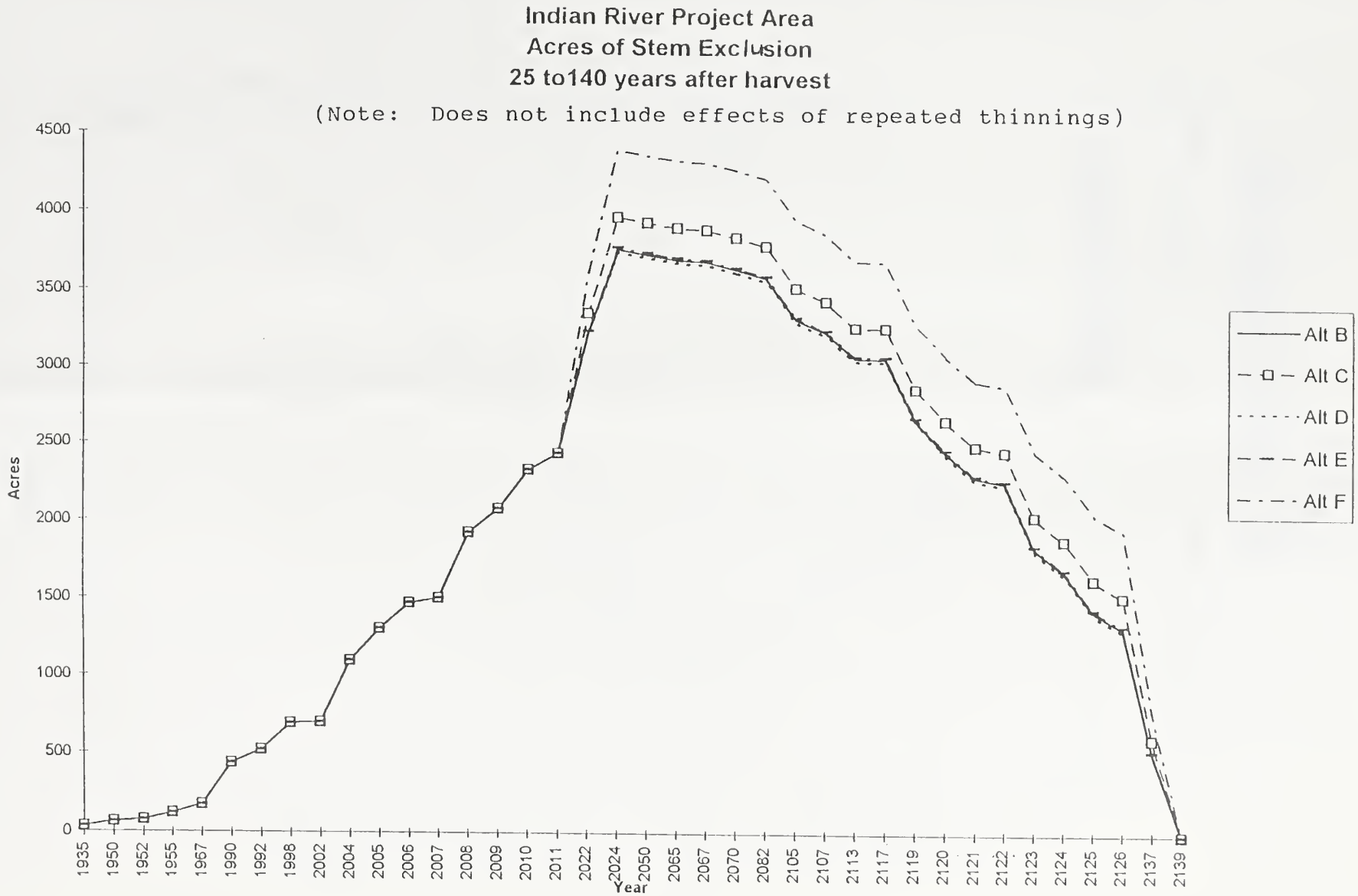
4 2 0 4 8
Scale in Miles

Source: TRUCS 1988 and Chatham Area GIS

Tenakee Springs Subsistence Deer Hunting Areas

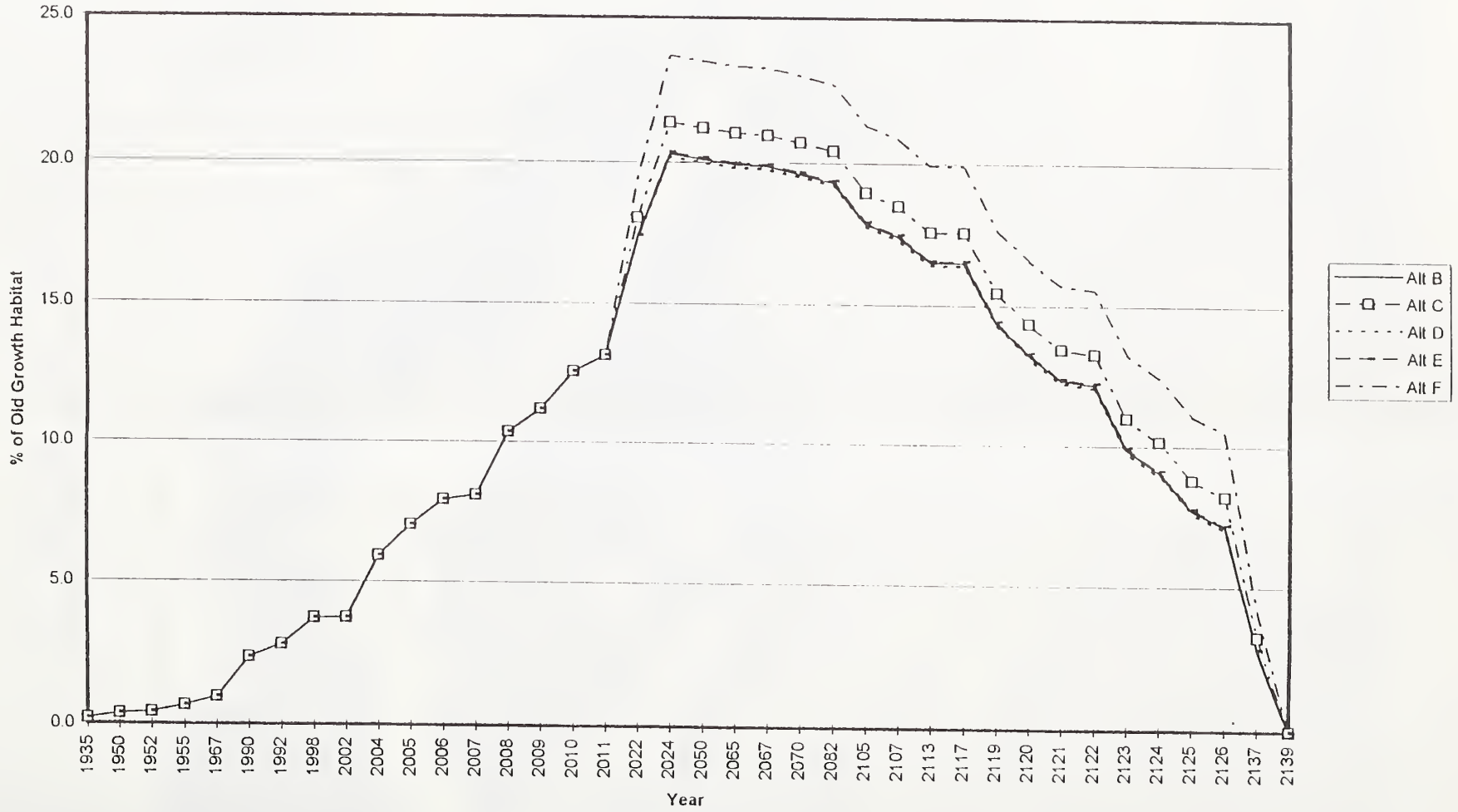


Source: TRUCS 1988 and Chatham Area GIS



In this example, Indian River Sale Area were considered to be harvested in 1997 (60%) and 1999 (40%).

INDIAN RIVER PROJECT AREA: PERCENT OF SECOND GROWTH HABITAT
IN STEM EXCLUSION 25 to 140 YEARS AFTER HARVEST
(Note: Does not include effects of repeated thinnings)



In this example, Indian River Sale Area were consider to be at harvested in 1997(60%) and 1999(40%).

Appendix G

Recreation

Indian River

Proposed Timber Sale

Recreation Existing Situation



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

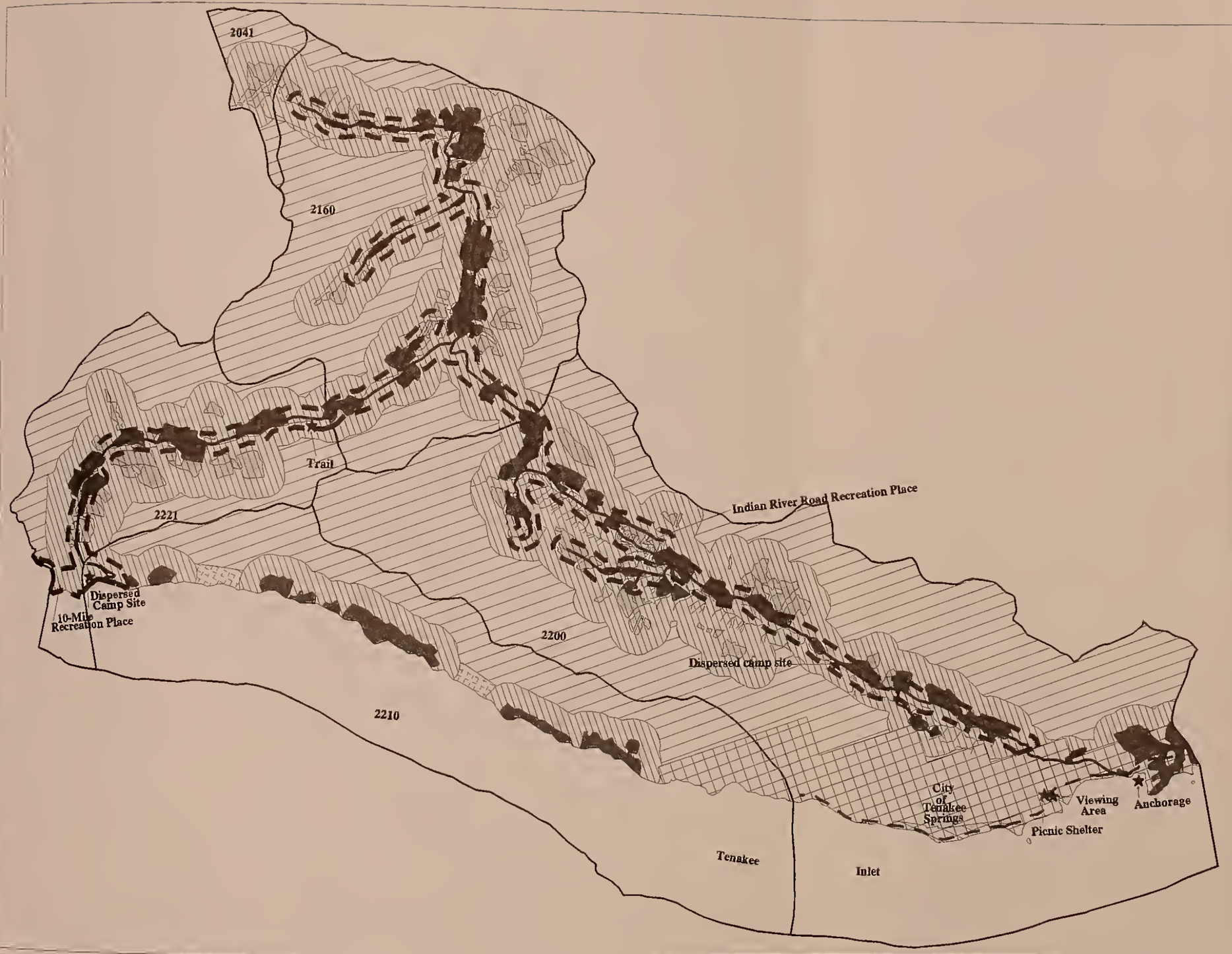
Mapscale 1:84480

Plotting Date 22 Jul 98 11:20:38 Wednesday from /u09/projects/mech/ir/requests/i344

Indian River

Proposed Timber Sale

Recreation Alternative B



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

Mapscale 1:84480

Plotting Date 22 Jul 98 11:00:37 Wednesday from /s09/projects/nech/ir/requests/i344

Indian River

Proposed Timber Sale

Recreation Alternative C



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

Mapscale 1:84480

Plotting Date 22 Jul 98 11:01:18 Wednesday from /u09/projects/nech/ir/requests/i344

Indian River

Proposed Timber Sale

Recreation Alternative D



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

Mapscale 1:84480

Plotting Date 22 Jul 98 13:37:18 Wednesday from /u09/projects/mech/ir/requests/i344

Indian River

Proposed Timber Sale

Recreation Alternative E



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

Mapscale 1:84480

Plotting Date 22 Jul 98 13:37:49 Wednesday from /u09/projects/mech/ir/requests/i344

Indian River

Proposed Timber Sale

Recreation Alternative F



Recreation Opportunity Spectrum

- Semi-Primitive Non-motorized
- Semi-Primitive Motorized
- Roaded Modified
- Rec-Place
- Trail
- Rec-sites
- Existing Harvest Units
- Proposed Harvest Units
- Existing Roads
- Proposed Roads
- Class 1 Streams
- Non-National Forest System Lands
- VCU Boundaries

1 0.5 0 1 2 Miles

Mapscale 1:84480

Plotting Date 22 Jul 98 13:38:36 Wednesday from /u09/projects/nech/ir/requests/i344

Appendix H

Landtype Associations and Biodiversity

LANDTYPE ASSOCIATION DESCRIPTIONS

Alpine and subalpine summits and ridges

Geomorphic Setting. This unit includes alpine and subalpine areas on both gently sloping summits and steep side slopes (10 to 120% slopes). The summits are both rounded and rugged. Many of the rugged summits are limestone and have many karst features. The soils are shallow and primarily formed in residuum or colluvium. On some of the flatter benches, the soils are slightly deeper and may have an organic epipedon (UDSA Forest Service 1986).

Hydrologic function. This LTA is both a conveyor and a receptor. Sheet flow and shallow pools appear temporarily during large storm events. This association conveys water to downslope landscapes. These areas accumulate considerable snow during some winters, which often lasts into May (Garvet et al. Unpublished map). Water primarily moves via surface and subsurface runoff in summit areas with bedrock other than limestone. Where limestone occurs, water also moves through subsurface fissures and streams (USDA Forest Service in prep). This water therefore often bypasses the downslope Steep Forested Mountain Slopes LTA to resurface as springs and resurgent streams above the valley floor. The soils are moderately well to somewhat poorly drained.

Vegetation, disturbance, and successional pathways. These summits and ridges generally have extensive areas of heath plant community types. Crowberry (*Empetrum nigrum*), Luetkea (*Luetkea pectinata*), Mertens mountain-heather (*Cassiope mertensiana*) and deer cabbage (*Fauria crista-galli*) are common species. Where soil has developed, these alpine and subalpine slopes have a rich diversity of plants especially on the calcareous summits. Mountain hemlock (*Tsuga mertensiana*) with minor amounts of Sitka spruce (*Picea sitchensis*) occurs in protected areas as a dwarf forest called *krummholz*. Tall blueberry (*Vaccinium spp.*) and copperbush (*Cladothamnus pyrolaeflorus*) are scattered among the trees (Martin et al. 1995). Alpine meadows, rock outcrop, and fellfield communities also occur. Disturbance processes include snow creep and wind effects. Successional changes are slow and plant communities are relatively fragile.

Brushfields

Geomorphic Setting. These snow accumulation and avalanche slopes are dominated by communities of Sitka alder and salmonberry. The steep avalanche slopes (50-140% slope) occur below summits and typically grade into Forested Mountain Slopes, depending on the slope and the avalanching that occurs. Avalanche slopes may extend to the valley floor in some areas. Mass wasting events are partially responsible for location and extent of this association. Water flowing over an impermeable layer probably initiates the mass wasting events. The soils are shallow to bedrock and have a high percentage of rock fragments. The soils are deeper in depositional areas with moderate slopes (USDA Forest Service 1986).

Hydrologic function. These surfaces are moderately well drained, and often have ample water running through the soil parallel to the slope. This association is a conveyer and donor of water to downslope associations (USDA Forest Service 1986).

Vegetation, disturbance, and successional pathways. These brushfields are dominated by Sitka alder (*Alnus sinuata)* and salmonberry (*Rubus spectabilis).* Other common species include lady fern (*Athyrium filix-femina),* Sitka willow (*Salix sitchensis),* stink currant (*Ribes bracteosum),* and false hellebore (*Veratrum viride).* Inclusions of subalpine meadows and krummholz mountain hemlock communities also occur. In some areas, Sitka spruce is slowly invading the brushfields (M. Shephard, pers. obsery.). This may be due to less snow accumulation and avalanching since the end of the Little Ice Age (approximately 1850).

Steep Forested Mountain Slopes

Geomorphic Setting. These forests occur primarily on steep slopes (50%+) on parent material of colluvium and residuum (Martin et al. 1995). Some of the steepest areas probably originated via disturbances such as Little Ice Age avalanche tracks. Slopes are commonly broken or frequently dissected by small streams. This is a common type within this Subsection.

Hydrologic function. This association is very steep and hence water is conveyed quickly to downslope LTAs such as the Colluvial/Fluvial/Coastal Surfaces landtype association. The soils are shallow to very deep and well to moderately well drained (USDA Forest Service 1986).

Vegetation, disturbance, and successional pathways. The dominant overstory species are Sitka spruce *(Picea sitchensis*), mountain hemlock (*Tsuga mertensiana*), and western hemlock (*Tsuga heterophylla*). Devil's club (*Oplopanax horridum*), blueberry (*Vaccinium* spp.) and copperbush (*Cladothamnus pyrolaeflorus*) [at higher elevations] are the primary tall shrubs (Martin et al. 1995). There also are open stands of mountain hemlock at higher elevations. On benches of broken slopes, mixed conifer open forest and nonforested wetland areas occur as inclusions in this LTA. Disturbance factors such as wind, snow, and soil movement are frequent enough to maintain Sitka spruce as a dominant tree species in this association.

Moderately Steep Forested Mountain Slopes
Geomorphic Setting. This unit contains productive forested slopes (10-45% slope) on parent material of till, colluvium, and residuum.

Hydrologic function. Water moves through these slopes, but not as quickly as it does through the Steep Forested Mountain Slopes. This association is less steep and contains more benches than the Steep Forested Mountain Slopes.

Vegetation, disturbance, and successional pathways. The dominant overstory species are western hemlock (*Tsuga heterophylla),* Sitka spruce (*Picea sitchensis),* and yellowcedar (*Chamaecyparis nootkatensis*). A wide variety of plant associations from the western hemlock, western hemlock-yellowcedar, and mixed conifer series occurs on this association. Devil's club (*Oplopanax horridum*) and blueberry (*Vaccinium* spp.) are the dominant tall shrubs. Bench inclusions may have mixed conifer open forest or nonforested wetland vegetation.

Forested Hills
Geomorphic setting. This landscape is primarily located on compact till. Organic soils develop in swales where drainage is slowed because of low permeability and gentle terrain. The soils are shallow over the till on slopes. These areas have no direct connection to alpine summits or ridges.

Hydrologic function. These areas are receptors and conveyors of water. Numerous depressions and swales are very poorly drained, while areas of colluvium are well drained (UDSA Forest Service 1986).

Vegetation, disturbance, and successional pathways. The forests are moderately to marginally productive for timber. Two common plant associations are western hemlock/blueberry and mixed conifer/blueberry. The vegetation mosaic is slowly changing as some areas are invaded by *Sphagnum* moss and other wetland species; while other areas slowly accumulate enough upland microsites that upland species dominate. Skunk cabbage (*Lysichitum americanum*) is a common forb in the wetter areas.

Colluvial/Fluvial/Coastal Surfaces
Geomorphic setting. Fluvial and colluvial processes are the primary influences along the flood plains, dissected footslopes, alluvial fans, uplifted beaches and rock headlands of the study area. The substrate within the river corridors is primarily gravel and coarse sand alluvium with inclusions of colluvium. Footslopes also have mineral soils with colluvium and alluvium in fan areas. Uplifted beach sediments are generally sand and gravel. These surfaces are all well to moderately well drained.

Hydrologic function. Except for the gently sloping or flat uplifted beaches, this landtype association is a major conveyor of water downslope. Within the flood plains, the soils are generally well drained near present channels. Further away from current channels, the soils may be somewhat poorly drained because of old overbank deposits and beaver activity. Soil development is dependent on surface age, material size, degree of material sorting, and flooding disturbance periodicity. Uplifted beaches are receptors of upslope water and conveyors of water to tidal flats and estuaries.

Vegetation, disturbance, and successional pathways. On the frequently disturbed flood plains and fans, the vegetation is composed of a wide to narrow band of red alder (*Alnus rubra*), Sitka alder (*Alnus sinuata*), and salmonberry (*Rubus spectabilis*). Black cottonwood (*Populus trichocarpa*) occurs in some areas. Highly productive Sitka spruce and western hemlock forests dominate the raised alluvial terraces above the yearly flood plain communities and the uplifted beaches and rock headlands. Disturbance maintains Sitka spruce as the dominant of most stands within this LTA. Infrequently disturbed alluvial terraces and colluvial slopes may have mixed conifer forest, tall shrub communities (e.g., Sitka willow [*Salix sitchensis*]), or nonforested wetlands.

Lowland Wetland-Forest Complex

Geomorphic Setting. Wide areas of forested and nonforested peatlands occur on compact till and glaciomarine silt deposits on flat to gently sloping areas. The soils are organic and deep to moderately deep with inclusions of better drained mineral soil throughout.

Hydrologic function. Water primarily enters the system from precipitation. Water moves slowly across these wetlands except during large storm events when the whole organic mat becomes saturated and sheet flow occurs. These wetlands are important in water retention for flood control. This LTA is primarily a donor of water to other landscapes. Some groundwater-fed wetlands are inclusions in this LTA, and they are both receptors and donors. Because of the fine-grained substrate and low gradient, this landscape is a prime location for *Sphagnum* growth.

Vegetation, disturbance, and successional pathways. Bogs (muskegs) are common, where peat moss (*Sphagnum* spp.) and sedge peat has accumulated and filled in small depressions and flats. They are primarily dominated by shorepine/sedge (*Pinus contorta/Carex* spp.) and tufted clubrush/peatmoss (*Scirpus caespitosum/Sphagnum*) community types. Where drainage is better, as along small stream channels, a shore pine or mixed conifer forested wetland occurs. Rich fens occur in this LTA where waters are calcium-rich, because of limestone bedrock, such as in the lower Indian River watershed.

Estuaries/Beaches

Geomorphic setting. These areas are directly influenced by tidal action (daily or yearly basis), such as supratidal meadows and intertidal flats. Riverine sands and silts are accumulated and reworked by tidal action. The extent of these deposits is highly influenced by the size of the inlet or bay, and tidal action. Many of these areas are not within the Analysis Area, since National Forest jurisdiction does not apply to lands below the mean high tide line.

Hydrologic function. The fine-grained substrates are deep and poorly drained. This LTA is a receptor of water from upslope and from saltwater. Along sloughs or small incised stream channels, drainage is better. Fine sand and silt limit water movement through the soil. Sea water inundates areas during large storms.

Vegetation and successional pathways. On the upper tidal flats, lyngbyei sedge (*Carex lyngbyei*), alkali grass (*Puccinellia* spp.), and other salt tolerant species dominate. Adjacent to estuaries, in the supratidal meadows, bluejoint (*Calamagrostis canadensis*), cow parsnip (*Heracleum lanatum*), and Sitka sedge (*Carex sitchensis*) are common species.

Plant Species Diversity

For the Northeast Chichagof Landscape Analysis Area, seven tree species are known (Tongass National Forest, Sitka Office IRI/ECO database 1997; M. Shephard, pers. comm. 1997):

western and mountain hemlock
yellowcedar
Sitka spruce
shore pine
black cottonwood
red alder

Twenty-nine shrub species, 106 forbs, 29 graminoids, 19 ferns/fern allies, and sphagnum moss have been observed during sampling of 39 vegetation plots, 16 sensitive plant surveys, and four fen surveys in the analysis area conducted in the 1980s and 1990s (Chatham Area IRI/ECO database 1997; Indian River Sensitive Plant Survey database 1997).

It is likely that additional species would be found with additional sampling, particularly in non-forest areas, since over half of the existing sampling was conducted in forested areas. Other than sphagnum moss, no moss sampling has been conducted. Worley (1972) reports 572 species and varieties of bryophytes for southeast Alaska: 159 hepatics (liverworts) and 413 mosses. Some portion of these occur in the analysis area. Lichen sampling conducted at Pavlov River, near the analysis area, found 30 species in a shore pine/ crowberry plot (Geiser et al. 1994). Many of these probably occur in the analysis area. No sampling for fungi or algae has occurred.

Because individual species tallies are difficult to conduct in a large area, we do not have data to support a complete listing of species for the analysis area or for the larger northeast Chichagof area. Those species that may be at risk are discussed in the Threatened, Endangered, and Sensitive Species Sections of this EIS.

Number of species varies by community type, with the greater number generally found in the more open overstory types. In order to conserve this biodiversity, since we cannot tally individual species, we revert to the coarse filter approach and attempt to conserve a diversity of habitats. For more information on species and plant communities on the Chatham Area, refer to Martin et al. (1995).

List of Common Plan Names

Common Name	Scientific Name
Alaska moss heather	*Cassiope stelleriana*
Aster	*Aster modestus*
Bent-leaf angelica	*Angelica genuflexa*
Blueberry	*Vaccinium ovalifolium, V. alaskaense*
Bluejoint	*Calamagrostis canadensis*
Copperbush	*Cladothamnus pyrolaeflorus*
Cow parsnip	*Heracleum lanatum*
Crabapple	*Malus fusca*
Crowberry	*Empetrum nigrum*
Devil's club	*Oplopanax horridum*
False hellebore	*Veratrum viride*
Hairgrass	*Deschampsia caespitosa*
Horsetail	*Equisetum arvense*
Lady fern	*Athyrium filix-femina*
Merten's mountain-heather	*Cassiope mertensiana*
Mountain hemlock	*Tsuga mertensiana*
Nagoonberry	*Rubus arcticus stellatus*
Oak fern	*Gymnocarpium dryopteris*
Pacific red elderberry	*Sambucus racemosa*
Peatmoss	*Sphagnum* species
Red Alder	*Alnum rubra*
Salmonberry	*Rubus spectabilis*
Shield fern	*Dryopteris austriaca*
Shooting star	*Dodecatheon jeffreyii*
Shore pine	*Pinus contorta*
Sitka alder	*Alnus sinuata*
Sitka sedge	*Carex sitchensis*
Sitka spruce	*Picea sitchensis*
Sitka willow	*Salix sitchensis*
Skunk cabbage	*Lysichitum americanum*
Stink currant	*Ribes bracteosum*
Swertia	*Swertia perennis*
Tufted clubrush	*Scirpus caespitosum*
Western hemlock	*Tsuga heterophylla*
Yarrow	*Achillea borealis*
Yellow cedar	*Chamaecyparis nootkatensis*

Appendix I

Road Cards

Indian River Timber Sale(s)
Road Cards

The road cards provide a summary of information about individual proposed or existing roads which are included in one or more alternatives. They display site-specific information such as additional mitigation measures, observations, and need for further assistance during field layout.

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (PAGE 1) VCU: 2200

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE NEEDED APPROVED BY: S.TRULL REMARKS: No concerns.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult with fish biologist if existing bridges are replaced with something other than bridge. * Consult road survey (1995) information and watershed analysis for entire 7500 road. Design and implement reconstruction as per BMPs 14.4 (LTF), 14.6, 14.8, 14.9, 14.14, 14.17.
{ HERITAGE } FIELD REVIEW: IN PROGRESS APPROVED BY: K.IWAMOTO REMARKS: High probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: One alluvial fan crossing; consult with hydrologist on structure size and position.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Road is located on lower edge of carbonate rock boundary, passing through small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns. Involve LA during site selection, design, and implementation of LTF.
{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs

INDIAN RIVER PROJECT ROAD CARD

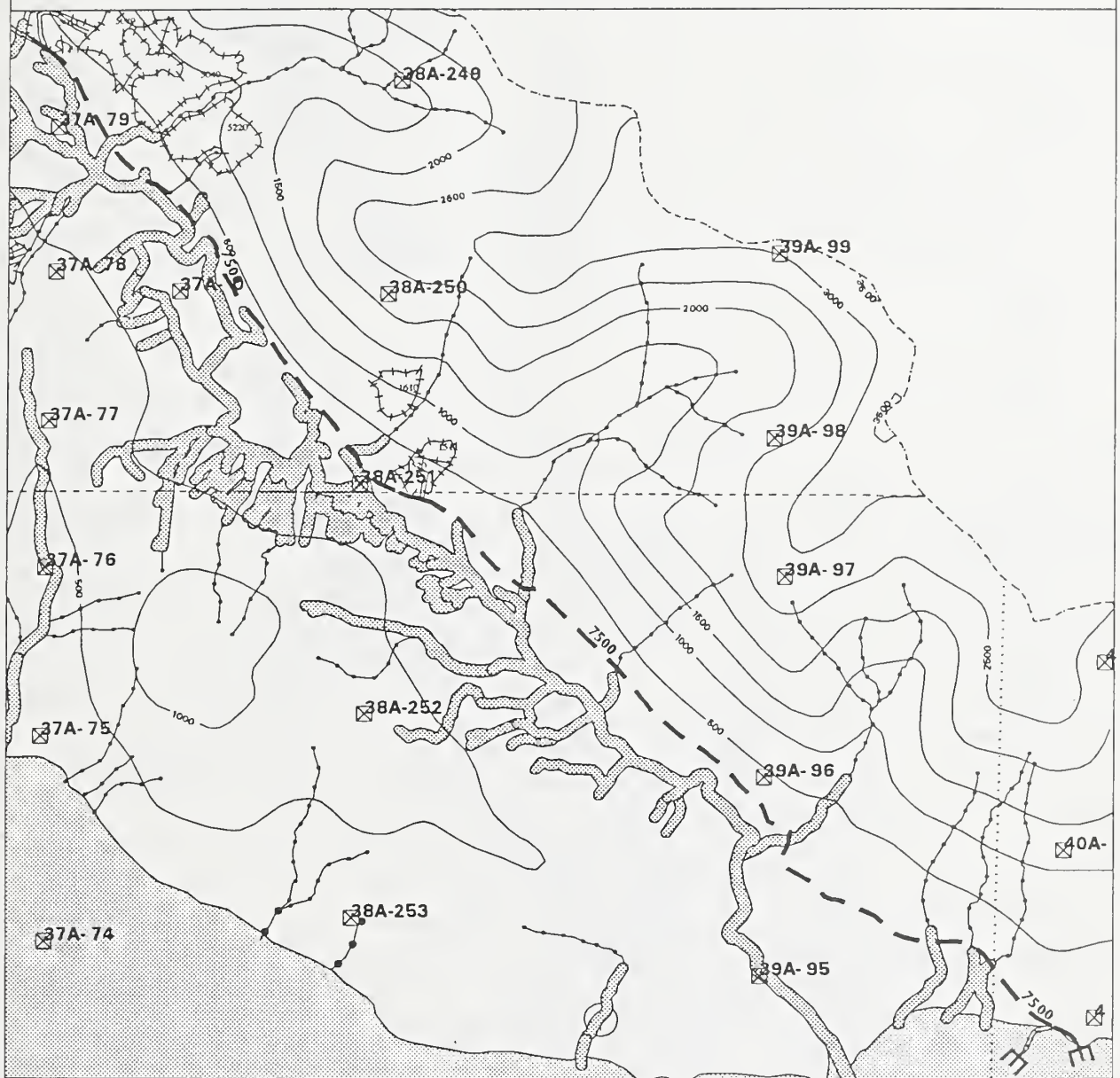
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 1

QUAD(S): SITD4SW, SITD4SE

VCU(S): 2200, 2201

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	5.59	5.49	0.00	5.59	5.49
Subject Road Planned	0.00	0.00	0.00	0.00	0.00
Total Miles	5.59	5.49	0.00	5.59	5.49



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (page 2) VCU: 2200

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE NEEDED APPROVED BY: S.TRULL REMARKS: No concerns.
{ **ECOLOGY** } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult with fish biologist when designing road reconstruction. Road has six washout sites, mostly at alluvial fan crossings (see hydrology remarks), and nine culverts (6 are barriers to fish passage) impacted by beaver activity in fen areas within the upper ½ of the IR watershed. In fen/wetland areas associated with beaver, design drainage as per BMP 14.17. Replace 60x84 inch squash pipe (major barrier to class I, mm2 channel) near upper end of road with bridge. BMPs 14.6, 14.8, 14.9, 14.14.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Five alluvial fan crossings. Consult with hydrologist on structure size and position.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Road is located on lower edge of carbonate rock boundary, passing through small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: Possible goshawk nest, segment 302. Survey for goshawks as funding allows. Follow S&Gs if active nest is located. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 2 QUAD(S): SITD4NW, SITD4SW

VCU(S): 2160, 2200

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	5.53	5.53	1.52	5.53	5.53
Subject Road Planned	0.00	0.00	0.00	0.00	0.00
Total Miles	5.53	5.53	1.52	5.53	5.53



INDIAN RIVER ROAD CARD

ROAD NUMBER: 7500 (page 3) VCU: 2200

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: M.DALTON APPROVED BY: S.TRULL REMARKS: Open forest/muskeg habitat; no sensitive plants found in survey of segment 5.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult with fish biologist/hydrologist when designing road reconstruction. Also consult road survey information (1995) and watershed analysis for entire South Fork of Freshwater Road. Existing road has 3 culverts that are fish barriers and another barrier where no structure was placed in a small stream in a fen-wetland area. Four washouts are present where alluvial fan (AF) channels cross the road. The upper NW end of the new road passes through several wetland-fen areas and crosses numerous small class I and II fish streams. Design and implement as per BMPs 14.2, 14.3, 14.6, 14.7-9, 14.12, 14.14, 14.17. See hydrology remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Five alluvial fan crossings. Consult with hydrologist on structure size and position, and during design and layout of segments 3, 6, 13, 22, and 27.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

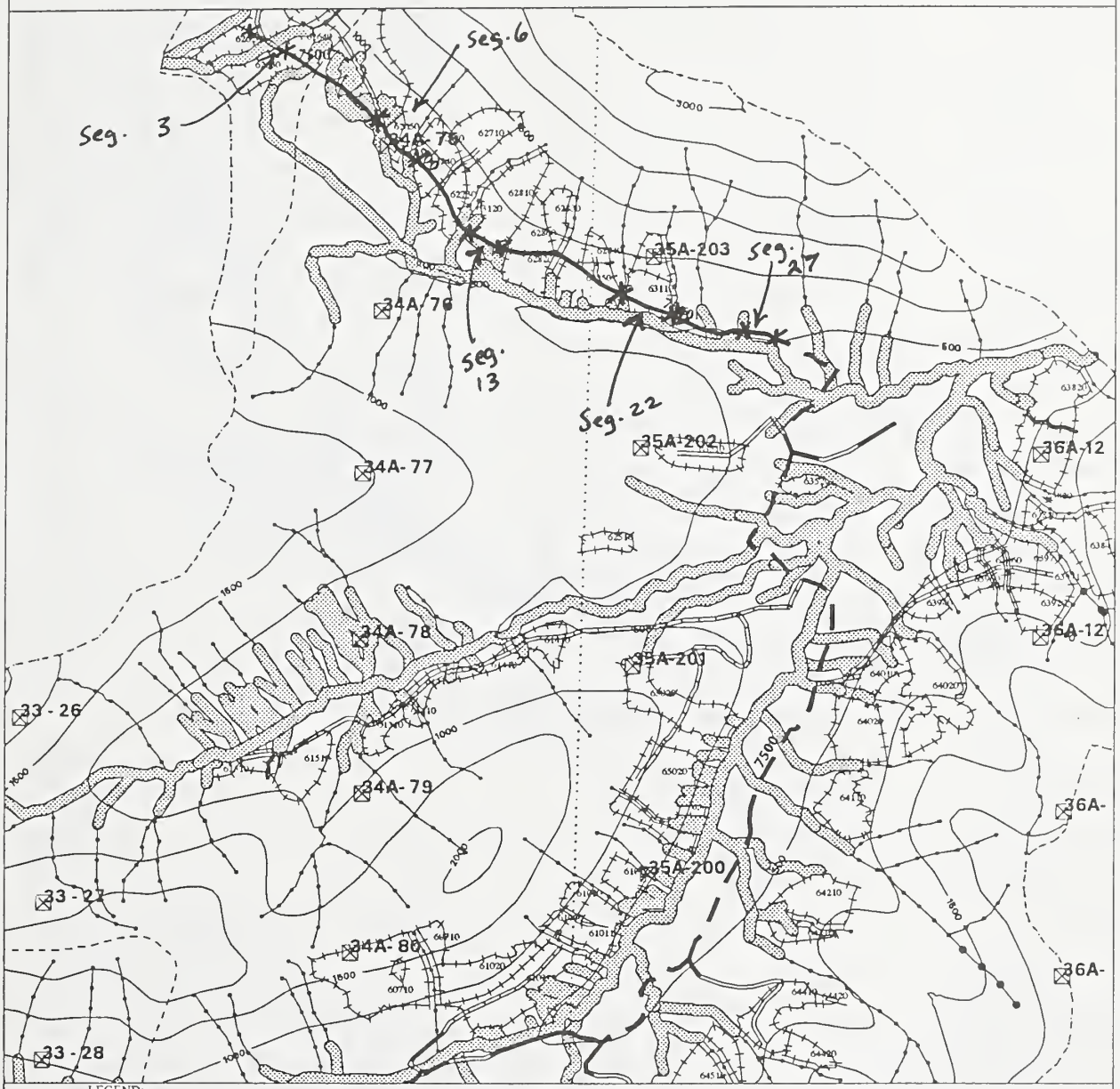
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7500 Page 3

QUAD(S): SITD5NE, SITD4NW

VCU(S): 2041, 2160

ALTERNATIVE	B	C	D	E	P
Subject Road Existing	3.45	3.45	3.45	3.45	3.45
Subject Road Planned	1.73	2.21	2.21	1.73	2.21
Total Miles	5.18	5.66	5.66	5.18	5.66



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75002 VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS:		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS:		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS:		
{ HERITAGE }	FIELD REVIEW: K.BROWN	APPROVED BY: K.IWAMOTO
REMARKS: Approximately 200' of East Tenakee Trail would be relocated in Alternative F.		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS:		
{ LANDS }	FIELD REVIEW:	APPROVED BY: J.MORRELL
REMARKS: Relocation of East Tenakee Trail in Alternative F will require approval by the State of Alaska, Department of Natural Resources.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: NONE	APPROVED BY: M.NELSON
REMARKS: Construction will disrupt use on East Tenakee Trail. See Appendix C, Recreation mitigation measures.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS:		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS:		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: J.COSTA
REMARKS:		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS:		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS:		

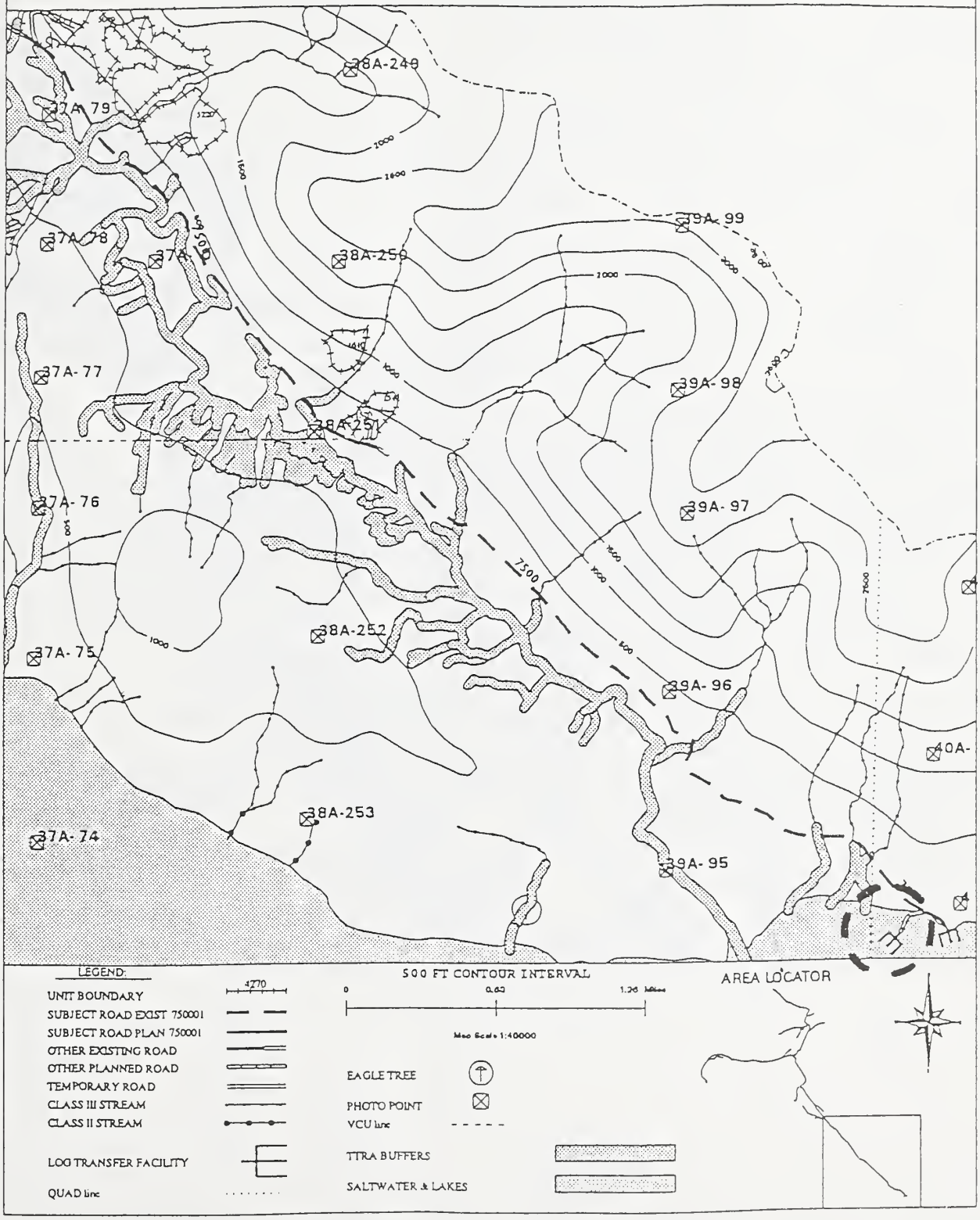
INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75002 QUAD(S): SITD4SW, SITD4SE

VCU(S): 2200

ALTERNATIVE	B	C	D	E	P
Subject Road Existing	0.00	0.00	0.00	0.00	0.00
Subject Road Planned	0.00	0.00	0.00	0.00	0.15
Total Miles	0.00	0.00	0.00	0.00	0.15



INDIAN RIVER ROAD CARD

ROAD NUMBER: 75003 VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist/hydrologist when designing road. Road crosses near upstream boundary of 4 class II fish streams; crosses about 10 small class IV streams; and a relatively large HC6 channel. Design and implement as per BMPs 14.2; 14.3; 14.6; 14.9; 14.12; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: D.KELLIHER	APPROVED BY: D.KELLIHER
REMARKS: Note BMPs 14.5; 14.7; 14.8; 14.9		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Road passes through small areas of moderate to high vulnerability. Maintain water quality, free flow of water.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: G.VIRTUE	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75003

QUAD(S): SITD4SW

VCU(S): 2200

ALTERNATIVE	B	C	D	E	P
Subject Road Existing	0.13	0.00	0.00	0.00	0.13
Subject Road Planned	0.54	0.00	0.00	0.00	0.54
Total Miles	0.67	0.00	0.00	0.00	0.67



LEGEND:

- UNIT BOUNDARY (4270)
- SUBJECT ROAD EXIST 75003
- SUBJECT ROAD PLAN 75003
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75004 VCU: 2200

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: Consult with hydrologist/fish biologist during final location and when designing road. Reconstruction segment of road crosses main channel, class I MM2 fish stream and several small class I/II palustrine (PAO) and/or footslope (FSO) streams. Protect streams as per BMPs 14.6; 14.9; 14.14; 14.17. New construction segment crosses about 8 small class IV footslope (FSO) channels. Protect as per BMPs 14.2; 14.3; 14.9; 14.12; 14.17.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Implement BMPs. One MM2 channel crossing; consult with hydrologist on structure sizing.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Intersection of road is located on small area of high vulnerability karst. Maintain water quality, free flow of water.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Full bench and endhaul in portions of segment 372, Consult with soil scientist during final location (segments 372, 377, 378).
{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: Recommend full bench and end haul, segment 372. Difficult grade and switchback in segment 378.
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75004 QUAD(S): SITD4SW

VCU(S): 2200

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.60	0.60	0.00	0.60	0.60
Subject Road Planned	0.56	0.56	0.00	0.56	0.56
Total Miles	1.15	1.15	0.00	1.15	1.15



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 75004
- SUBJECT ROAD PLAN 75004
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75007 VCU: 2160

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: M.DALTON M. SHEPHARD APPROVED BY: S.TRULL REMARKS: Sensitive plants found in 1995 and 1996 surveys of segments 115 and 121. Recommend moving road uphill 150 feet minimum from road line flagged in field (as of 7/96). Botanist to accompany road locators.
{ **ECOLOGY** } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult hydrologist/fish biologist when designing road. Road crosses at least three relatively high power HC2 or HC3 streams, as well as at least 4 smaller FSO (footslope) streams. The road crosses a number of these right at the upstream boundary of class II habitat. Design crossings as per BMPs 14.2; 14.3; 14.6; 14.7; 14.9; 14.12; 14.14; 14.17.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: B.CRIDER APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75007

QUAD(S): SITD4NW, SITD5NE

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.00	0.00	0.00	0.00	0.00
Subject Road Planned	1.76	1.82	1.82	1.82	1.82
Total Miles	1.76	1.82	1.82	1.82	1.82



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 75007
- SUBJECT ROAD PLAN 75007
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

4270

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 750071 VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: M.DALTON	APPROVED BY: S.TRULL
REMARKS: Open forest habitat; no sensitive plants found on survey of segment 168.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: NONE	APPROVED BY: G.KILLINGER
REMARKS: see hydrology remarks.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: Road crosses several small hillslope streams. Design as per BMPs 14.5; 14.7; 14.8; 14.9.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: NONE	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: NONE	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 750071

QUAD(S): SITD4NW

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.00	0.00	0.00	0.00	0.00
Subject Road Planned	0.00	0.99	0.99	0.99	0.99
Total Miles	0.00	0.99	0.99	0.99	0.99



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 750071
- SUBJECT ROAD PLAN 750071
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line
- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

4270

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7501 VCU: 2200

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult fish biologist/hydrologist when designing road reconstruction and new construction. Also consult road survey (1995) and watershed analysis for site information. The road crosses through a large fen area with several class I palustrine (PA1 and PAO) streams, and crosses at least 3 alluvial fan (AF1) channels (class I and II) and 2 high power, deeply incised HC6 channels. Design as per BMPs 14.2; 14.3; 14.6; 14.8; 14.9; 14.12; 14.14; 14.17.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Two alluvial fan crossings. Consult hydrologist on structure size and position.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Consult with soil scientist during layout and design.
{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: B.CRIDER APPROVED BY: B.CRIDER REMARKS: Soils review segment 415.
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7501

QUAD(S): SITD4SW

VCU(S): 2200

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.61	0.61	0.00	0.61	0.61
Subject Road Planned	0.94	0.94	0.00	0.94	0.94
Total Miles	1.55	1.55	0.00	1.55	1.55



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 7501
- SUBJECT ROAD PLAN 7501
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75012 VCU: 2200

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: Consult with fish biologist when designing road reconstruction and new construction. The road crosses at least one class I FPO stream and several smaller palustrine (PAO) channels. Design as per BMPs 14.6; 14.9; 14.17.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: L.SHIPLEY	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75012 QUAD(S): SITD4SW

VCU(S): 2200

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.18	0.18	0.00	0.00	0.18
Subject Road Planned	0.00	0.00	0.00	0.00	0.00
Total Miles	0.18	0.18	0.00	0.00	0.18



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 75012
- SUBJECT ROAD PLAN 75012
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7502 VCU: 2160, 2221, 2210

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: M.DALTON APPROVED BY: S.TRULL REMARKS: Beach habitat at proposed LTF. No sensitive plants found in survey of segment 326.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER (Old road only) REMARKS: Consult w/ fish biologist when designing reconstruction and new construction. See road survey (1995) & watershed analysis for site information/design/RMO guidance. Existing road has 3 washouts at alluvial fan (AF) channel crossings; several small landslides; and at least 4 failed culverts. The existing road also crosses 15 fish streams. Install "oversized" culverts, ditch blocks, and armored dips at existing alluvial fan washouts.
{ HERITAGE } FIELD REVIEW: YES APPROVED BY: K.IWAMOTO REMARKS: High probability zone. No cultural resources identified at LTF.
{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER REMARKS: Implement BMPs. Concerned about V-notch crossing at segment 315. Two alluvial fans; one MM2 crossing. Consult with hydrologist. See soils remarks.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Road is located on some small areas of low, moderate, and high vulnerability karst, as well as non-carbonated rock areas. Maintain water quality, free flow of water.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: Severe soils concerns along part of segment 326; recommend deleting. Consult soil scientist/hydrologist during design and layout of segments 298, 315, 320, 326.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: B.CRIDER/G.VIRTUE APPROVED BY: B.CRIDER REMARKS: Concern about switchbacks, oversteep slopes, and grade, and need for full bench and end hauling along portions of segment 326. Recommend full bench with end haul along segment 315.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: Concern on segment 326. Involve LA during site selection, design, and implementation of LTF.
{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

INDIAN RIVER PROJECT ROAD CARD

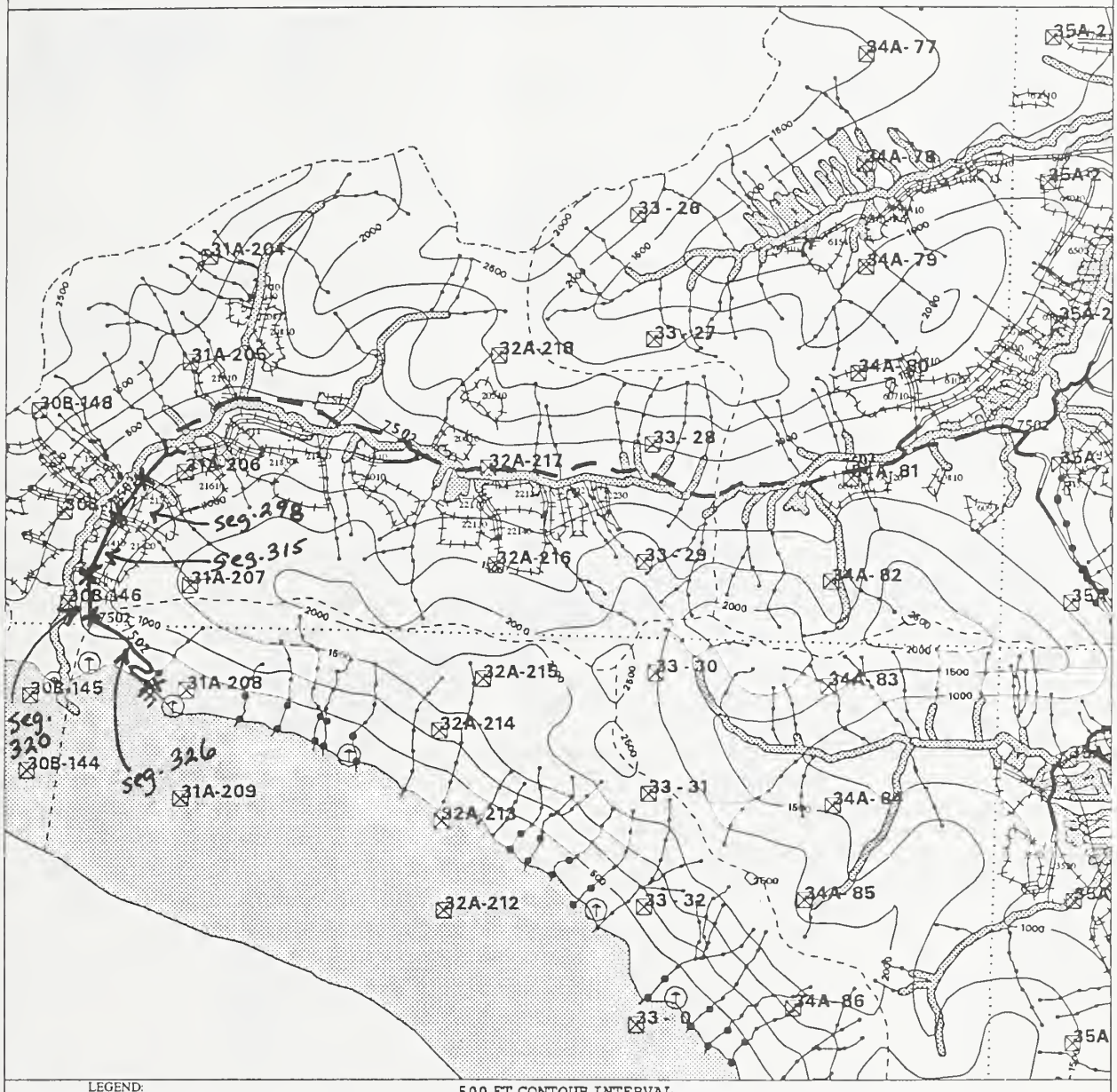
PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7502

QUAD(S): SITD4NW, SITD5NE, SITD5SE

VCU(S): 2160, 2221, 2210

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	5.34	5.34	5.34	5.22	5.34
Subject Road Planned	1.71	0.27	1.71	0.00	0.00
Total Miles	7.05	5.62	7.05	5.22	5.34



LEGEND:

- UNIT BOUNDARY (4270)
- SUBJECT ROAD EXIST 7502
- SUBJECT ROAD PLAN 7502
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.85 1.69 Miles

Map Scale 1:60000

EAGLE TREE

PHOTO POINT

VCU line

TTRA BUFFERS

SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75021 VCU: 2160

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: See hydrology remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER REMARKS: Consult hydrologist when designing road. This proposed road crosses a large class I, mm2 channel, a high power HC6 channel and more than 10 small class III hillslope streams. Design as per BMPs 14.5; 14.6; 14.7; 14.8; 14.9; 14.12; 14.17.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: Recommend spec status.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

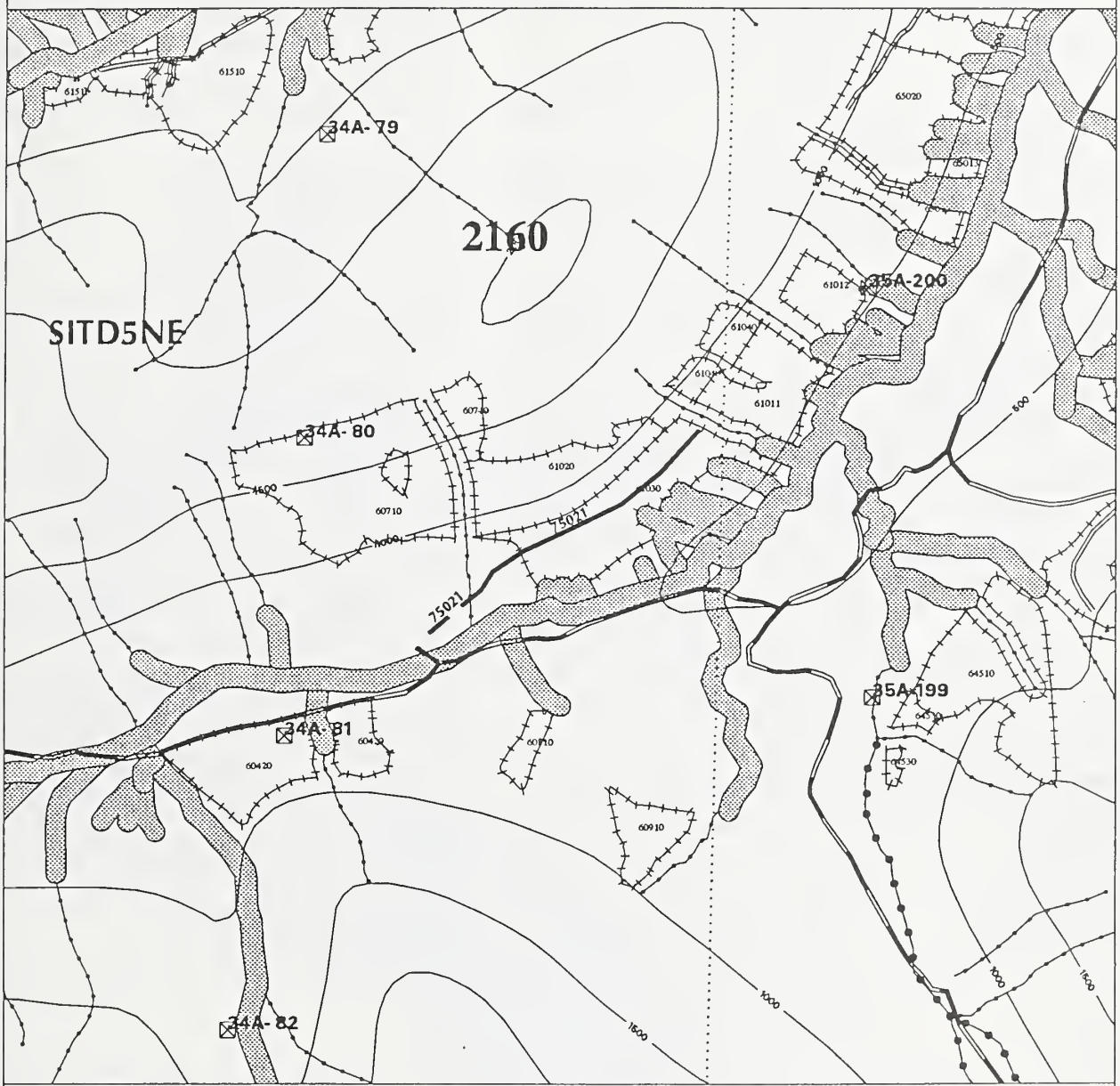
INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75021 QUAD(S): SITD5NE

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.22	0.22	0.22	0.22	0.22
Subject Road Planned	0.54	0.54	0.54	0.54	0.54
Total Miles	0.76	0.76	0.76	0.76	0.76



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 75021
- SUBJECT ROAD PLAN 75021
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75023 VCU: 2221

REVIEW INFORMATION		
{ BOTANY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
{ ECOLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
{ FISHERIES } REMARKS:	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
{ HERITAGE } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
{ HYDROLOGY } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
{ LANDS } REMARKS:	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
{ MINERALS/KARST } REMARKS: Vulnerability risk = None.	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
{ RECREATION } REMARKS:	FIELD REVIEW: YES	APPROVED BY: M.NELSON
{ SILVICULTURE } REMARKS: No concerns.	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
{ SOILS } REMARKS:	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
{ TIMBER } REMARKS:	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
{ TRANSPORTATION } REMARKS:	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
{ VISUAL } REMARKS:	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
{ WILDLIFE } REMARKS:	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75023 QUAD(S): SITDSNE

VCU(S): 2221

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0	0	0	0.21	0.21
Subject Road Planned	0	0	0	0.00	0.00
Total Miles	0	0	0	0.21	0.21



LEGEND

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 7502
- SUBJECT ROAD PLAN 7502
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line
- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

500 FT CONTOUR INTERVAL

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 75028 VCU: 2221

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: Consult with hydrologist/fish biologist when designing road. Short road crosses a small class II footslope stream (MM0), a higher power class II, HC2 channel and several smaller footslope streams. Design and implement as per BMPs 14.6; 14.8; 14.9; 14.12; 14.17.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: BMP 14.17. See soils remarks.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc.APPROVED BY: R.BAER REMARKS: Road is located on areas of moderate and high vulnerability karst. Maintain water quality, free flow of water.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Consult soil scientist/hydrologist during design and layout of segments 205 and 222. See transportation recommendations.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: Recommend spec status. Recommend full bench with end haul on portions of segment 222.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

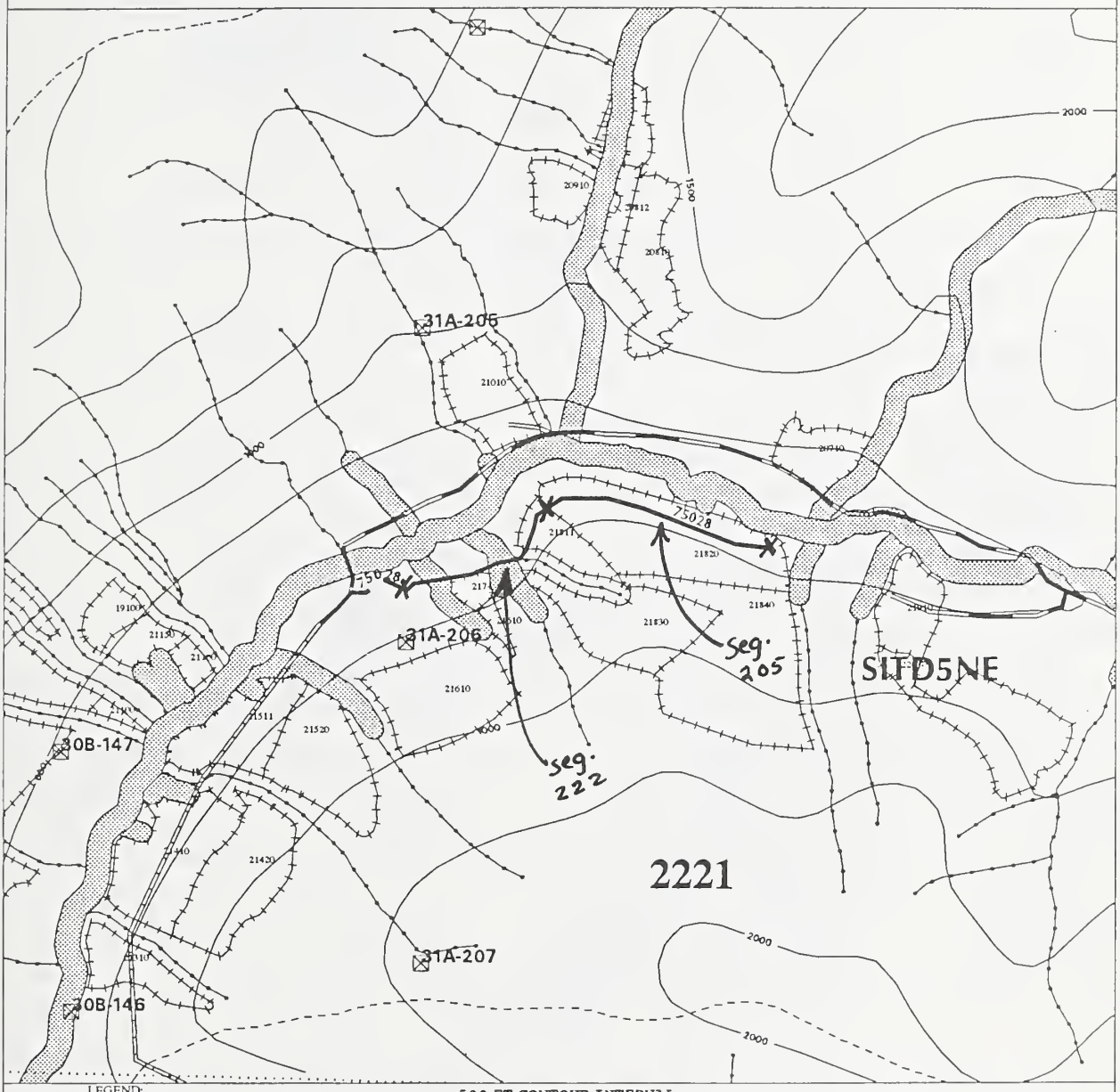
INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 75028 QUAD(S): SITD5NE

VCU(S): 2221

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.12	0.12	0.12	0.12	0.12
Subject Road Planned	0.00	0.80	0.80	0.80	0.80
Total Miles	0.12	0.92	0.92	0.92	0.92



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 75028
- SUBJECT ROAD PLAN 75028
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7507 VCU: 2160

REVIEW INFORMATION		
{ BOTANY }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ ECOLOGY }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ FISHERIES }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ HERITAGE }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone.		
{ HYDROLOGY }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ LANDS }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS:		
{ MINERALS/KARST }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ RECREATION }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ SILVICULTURE }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ SOILS }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ TIMBER }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ TRANSPORTATION }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ VISUAL }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ WILDLIFE }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7507

QUAD(S): SITD5NE, SITD4NW

VCU(S): 2160

ALTERNATIVE	B	C	D	E	P
Subject Road Existing	0.08	0.08	0.08	0.08	0.08
Subject Road Planned	0	0	0	0	0
Total Miles	0.08	0.08	0.08	0.08	0.08



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 750003
- SUBJECT ROAD PLAN 750003
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7508 VCU: 2160

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: M.DALTON M.SHEPHARD APPROVED BY: S.TRULL REMARKS: Open forest/muskeg habitat; sensitive plants found in survey of segment 128. Move road location slightly from 7/96 field-flagged line. Botanist to be present with road locators on segment 128.
{ ECOLOGY } FIELD REVIEW: NONE APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Consult with fish biologist and hydrologist when designing this road. The road crosses through/by some muskeg and small fen areas. The road crosses a number of smaller footslope and hillslope class II and IV channels; a larger class II MMl channel, and several deeply incised HC channels. Design and implement as per BMPs 14.2; 14.3; 14.5; 14.6; 14.7; 14.8; 14.9; 14.17.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER REMARKS: BMPs 14.5; 14.7; 14.8; 14.9; 14.17.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Consult with soil scientist during design.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER REMARKS: High cost bridge at the Class I stream crossing segment 128. Recommend full bench and end haul along segment 128.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY REMARKS: No concerns. Follow RMOs.

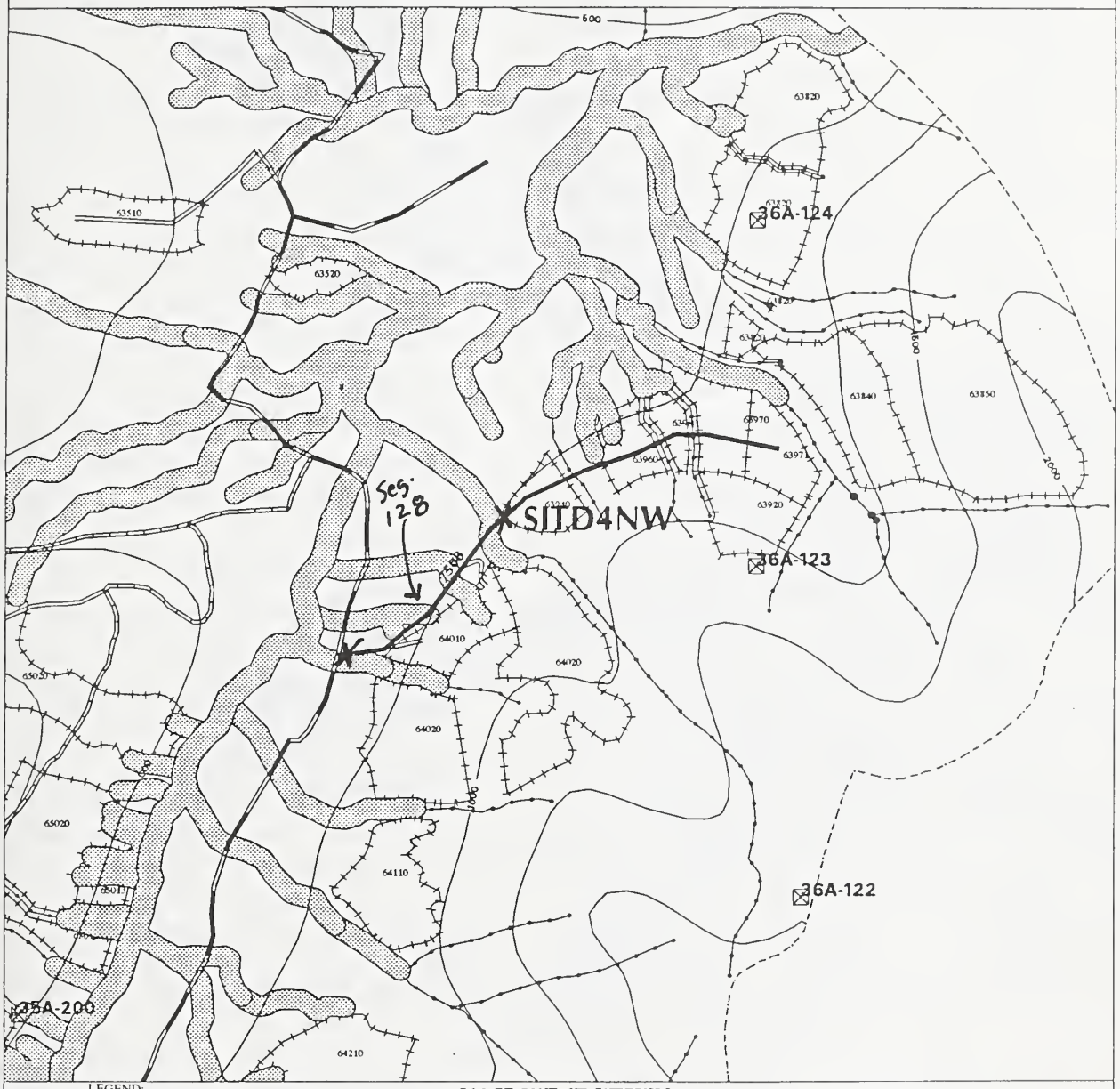
INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7508 QUAD(S): SITD4NW

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.00	0.00	0.00	0.00	0.00
Subject Road Planned	0.00	1.02	1.02	1.02	1.02
Total Miles	0.00	1.02	1.02	1.02	1.02



LEGEND:

- UNIT BOUNDARY 4270
- SUBJECT ROAD EXIST 7508
- SUBJECT ROAD PLAN 7508
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.33 0.67 Miles

Map Scale 1:21120

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

INDIAN RIVER ROAD CARD

ROAD NUMBER: 7509 VCU: 2160

REVIEW INFORMATION		
{ **BOTANY** }	FIELD REVIEW: NONE	APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.		
{ **ECOLOGY** }	FIELD REVIEW: NONE	APPROVED BY: T.GARVEY
REMARKS: No concerns.		
{ **FISHERIES** }	FIELD REVIEW: G.KILLINGER	APPROVED BY: G.KILLINGER
REMARKS: No concerns.		
{ **HERITAGE** }	FIELD REVIEW: NONE NEEDED	APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone.		
{ **HYDROLOGY** }	FIELD REVIEW: NONE	APPROVED BY: D.KELLIHER
REMARKS: No concerns.		
{ **LANDS** }	FIELD REVIEW: NONE NEEDED	APPROVED BY: J.MORRELL
REMARKS: No concerns.		
{ **MINERALS/KARST** }	FIELD REVIEW: HARZA NW, Inc.	APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.		
{ **RECREATION** }	FIELD REVIEW: YES	APPROVED BY: M.NELSON
REMARKS: Not applicable.		
{ **SILVICULTURE** }	FIELD REVIEW: NONE	APPROVED BY: S.BEALL
REMARKS: No concerns.		
{ **SOILS** }	FIELD REVIEW: J.WINN	APPROVED BY: J.WINN
REMARKS: No concerns.		
{ **TIMBER** }	FIELD REVIEW: NONE	APPROVED BY: M.REGAN
REMARKS: No concerns.		
{ **TRANSPORTATION** }	FIELD REVIEW: B.CRIDER	APPROVED BY: B.CRIDER
REMARKS: No concerns.		
{ **VISUAL** }	FIELD REVIEW: B.HAMBERG	APPROVED BY: B.HAMBERG
REMARKS: No concerns.		
{ **WILDLIFE** }	FIELD REVIEW: S.WOLF	APPROVED BY: L.SHIPLEY
REMARKS: No concerns. Follow RMOs.		

INDIAN RIVER PROJECT ROAD CARD

PLANNED ROAD ROUTE MAP

ROUTE NUMBER: 7509 QUAD(S): SITD5NE, SITD4NW

VCU(S): 2160

ALTERNATIVE	B	C	D	E	F
Subject Road Existing	0.42	0	0	0	0
Subject Road Planned	0	0	0	0	0
Total Miles	0.42	0	0	0	0



LEGEND:

- UNIT BOUNDARY
- SUBJECT ROAD EXIST 7500003
- SUBJECT ROAD PLAN 7500003
- OTHER EXISTING ROAD
- OTHER PLANNED ROAD
- TEMPORARY ROAD
- CLASS III STREAM
- CLASS II STREAM
- LOG TRANSFER FACILITY
- QUAD line

500 FT CONTOUR INTERVAL

0 0.63 1.26 Miles

Map Scale 1:40000

- EAGLE TREE
- PHOTO POINT
- VCU line
- TTRA BUFFERS
- SALTWATER & LAKES

AREA LOCATOR

Appendix J

Unit Cards

Indian River Timber Sale(s)
Unit Cards

The unit cards provide a summary of the information about the individual proposed harvest units which are included in one or more alternatives. They portray the site-specific information such as additional mitigation, observations, and where further assistance will be needed during field layout.

The unit cards reflect the desirable condition of the final unit as developed through the interdisciplinary process. They also provide the reviewer with an opportunity to compare the units as they appear in the different alternatives.

Unit cards are used in concert with the silvicultural prescription to aid the field implementation personnel in obtaining the desired objectives as developed by the interdisciplinary team and selected in the Record of Decision.

INDIAN RIVER UNIT CARD

UNIT: 1511 VCU: 2200
ACRES: 5.3 VOLUME (MBF): 148

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	30	Helicopter	Single Tree Selection
E	20	30	Helicopter	Single Tree Selection
F	20	30	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist for vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend Single Tree Selection for soil protection.

{ SOILS } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: Maintain two-thirds root strength to maintain soil stability.

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

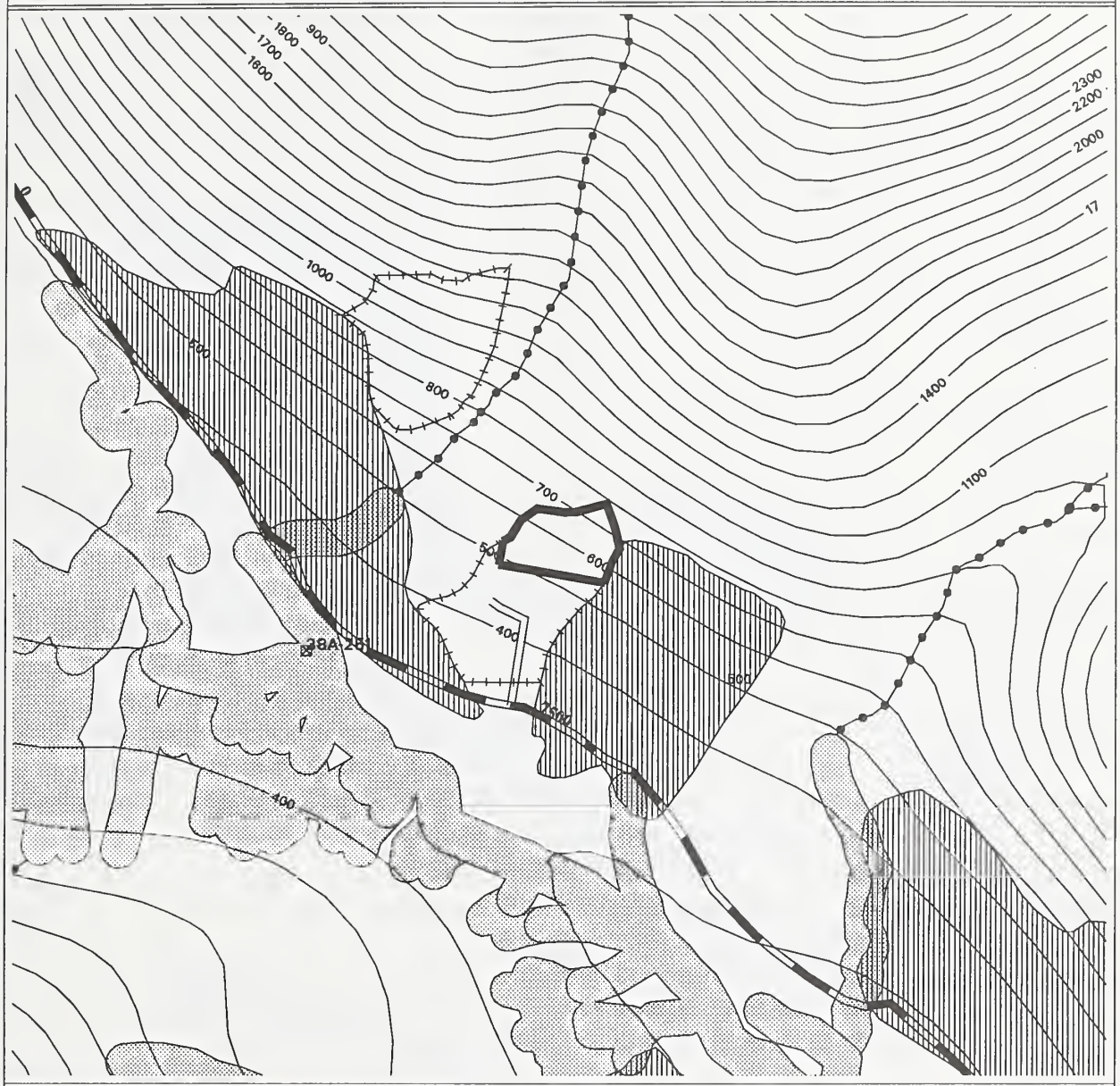
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP). Buffers and unharvested areas provide suitable travel corridors.

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 1511 QUAD(s): SITD4SW

ACRES: 5 Unit 1511 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/2098

INDIAN RIVER UNIT CARD

UNIT: 1520 VCU: 2200
ACRES: 10.9 VOLUME (MBF): 310

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	62	Shovel	Group Selection
E	95	295	Shovel	Clearcut w/ retention
F	95	295	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Low.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ **SOILS** } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

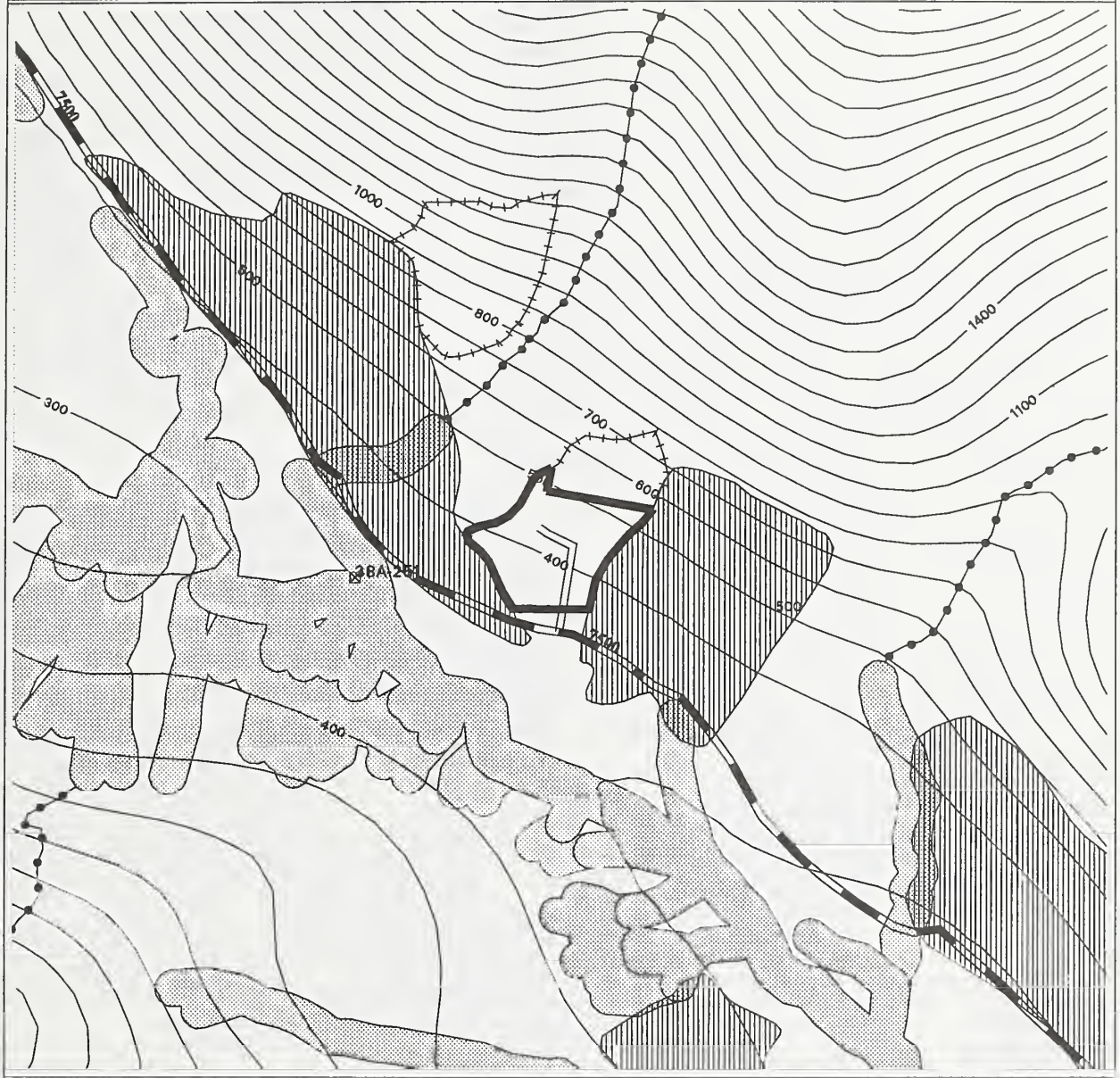
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 1520 QUAD(s): SITD4SW

ACRES: 11 Unit 1520 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 1610 VCU: 2200
ACRES: 14.2 VOLUME (MBF): 193

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	96	Helicopter	Overstory Removal
E	35	68	Helicopter	Patch Clearcut
F	35	68	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Significant alpine/subalpine Habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Leave windfirm boundary on Class III HC6 channel (category B) on SE. If possible, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on southeast side of unit. (See Fisheries).

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: Alt. B does not meet VQO. LA to assist in unit layout. Alt. E and F meet VQO.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Red-tailed hawk sighted. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 1610 QUAD(s): SITD4SW

ACRES: 14 Unit 1610 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/2098

INDIAN RIVER UNIT CARD

UNIT: 2220 VCU: 2200
ACRES: 31.9 VOLUME (MBF): 521

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	494	Helicopter	Clearcut w/ retention
F	95	494	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. Low survey priority.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag multiple Class II (category A) fish streams along lower boundary of main unit and on either side of isolated unit blocks. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: G.KILLINGER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16; Leave windfirm boundary on Class III streams. Windfirm boundaries can be established by feathering buffer or harvesting trees with 1/3 or more of length above slope break to stream channel. Southeast winds are dominant in the Indian River Valley. However, the less frequent north winds can be severe.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Cedar decline, V-notches, volume. Recommend salvage, clearcut with retention, or group selection.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Decadent, uneconomical. Recommend clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2220 QUAD(s): SITD4SW

ACRES: 32 Unit 2220 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT--HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 2310 VCU: 2200
ACRES: 9.7 VOLUME (MBF): 160

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	152	Helicopter	Clearcut w/ retention
E	95	152	Helicopter	Clearcut w/ retention
F	95	152	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag Class II (category A) fish streams along lower boundary between unit blocks and on north and south boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Upstream of Class II break, identified streams are category B. Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule) on category B streams. Protect as per BMP 13.16 (and 13.3). Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, on category A streams. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs.(BMP 12.6a; 13.16). Windfirm boundaries to Class III streams.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention, helicopter yarding, partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

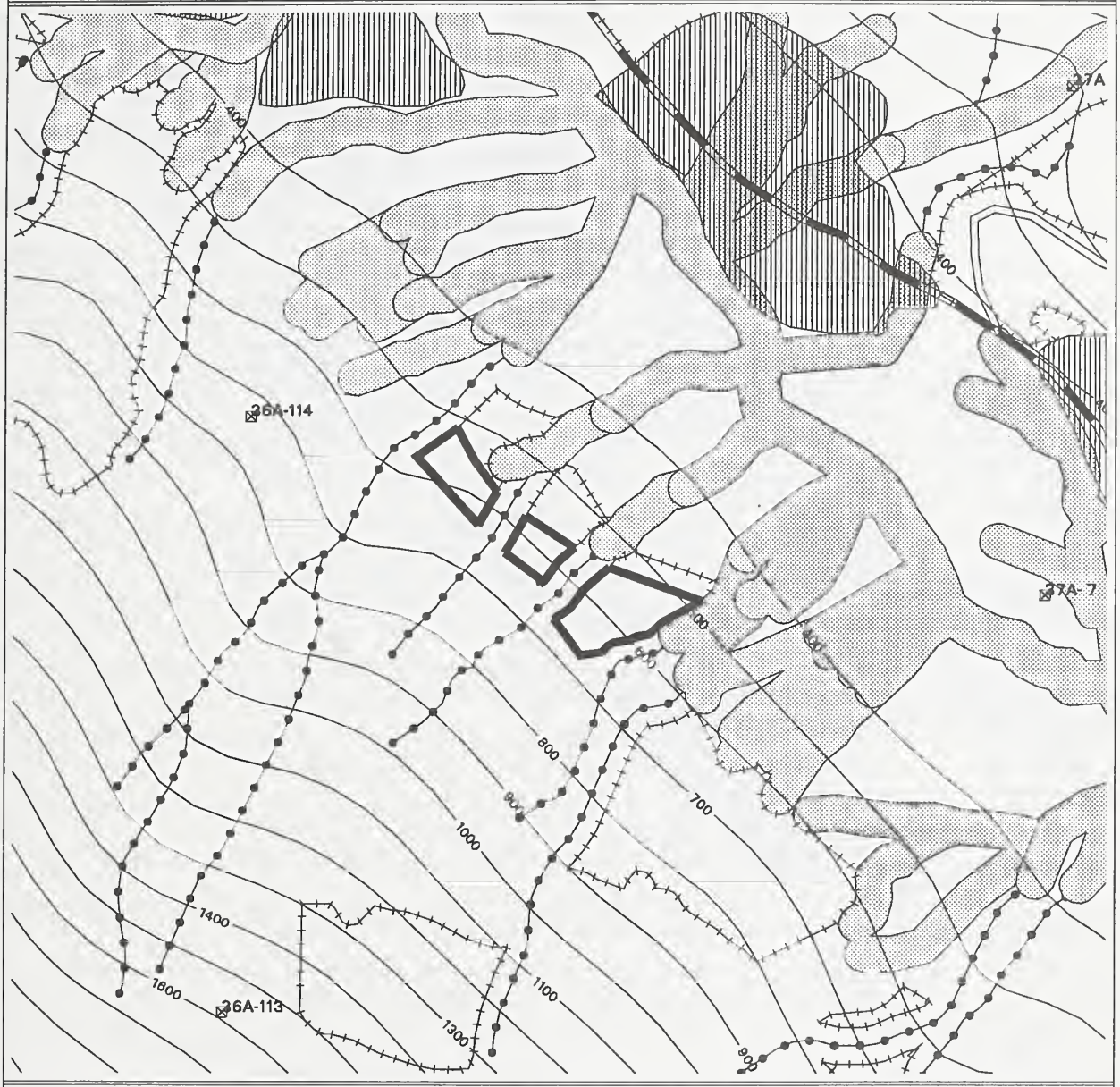
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Possible goshawk sighted; surveys did not locate nest in area. Continue goshawk surveys as funding allows. If active nest is located, implement TES goshawk S&G J.1.a)(1-6)b)c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2310 QUAD(s): SITD4SW

ACRES: 10 Unit 2310 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 2340 VCU: 2200
ACRES: 7.6 VOLUME (MBF): 138

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	95	131	Helicopter	Clearcut w/ retention
F	95	131	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag Class II (category A) fish streams along lower boundary between unit blocks and along north and south boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Upstream of Class II break, identified streams are category B. Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule)on category B streams. Protect as per BMP 13.16 (and 13.3). Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, on category A streams. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries on streams. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend clearcut with retention or Single Tree Selection salvage, helicopter yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Possible goshawk sighted; surveys did not locate nest in area. Continue goshawk surveys as funding allows. If active nest is located, implement TES goshawk S&G J.1.a)(1-6)b)c. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified) 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2340 QUAD(s): SITD4SW

ACRES: 8 Unit 2340 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/99

INDIAN RIVER UNIT CARD

UNIT: 2710 VCU: 2200
ACRES: 45.9 VOLUME (MBF): 667

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	95	634	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Open forest habitat; no sensitive plants found in unit; but some found outside, near unit.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Buffer lower fish streams in unit. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower boundary (small streams) and north and south boundaries (larger AF1 and HC6 channels). Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Buffer AF1 channel as directed by TLMP. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Upstream of Class II break, the deeply incised NW and SE boundary streams are category B. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary and place unit boundary at or above slope break of Class III channels (2/3 rule) on the category B streams. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class III streams. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend Single Tree Selection for 30% of volume or clearcut with retention.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Recommend feathered buffer on V-notch on northwest side for windfirmness and windfirm boundary on southeast side of unit, using 2/3 rule.

{ TIMBER } FIELD REVIEW: L.WINN M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2710 QUAD(s): SITD4SW

ACRES: 46 Unit 2710 Occurs in Alternatives: E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 2810 VCU: 2200
ACRES: 13.6 VOLUME (MBF): 288

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	273	Cable	Clearcut w/ retention
C	95	273	Cable	Clearcut w/ retention
F	95	273	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams along lower boundary small streams and larger streams on North and South (AF1 and HC6 channel) boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Buffer AF1 channel as per TLMP direction. Where possible, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. Upstream of Class II break, NW and S boundary streams are category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule) on category B streams. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend partial suspension, seed tree cut, clearcut with retention, or group selections.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial suspension in southern 1/3 of unit to protect v-notches. Leave windfirm boundary in southern boundary of unit. Split-yard v-notch in southern 1/3 of unit.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Clearcut with retention.

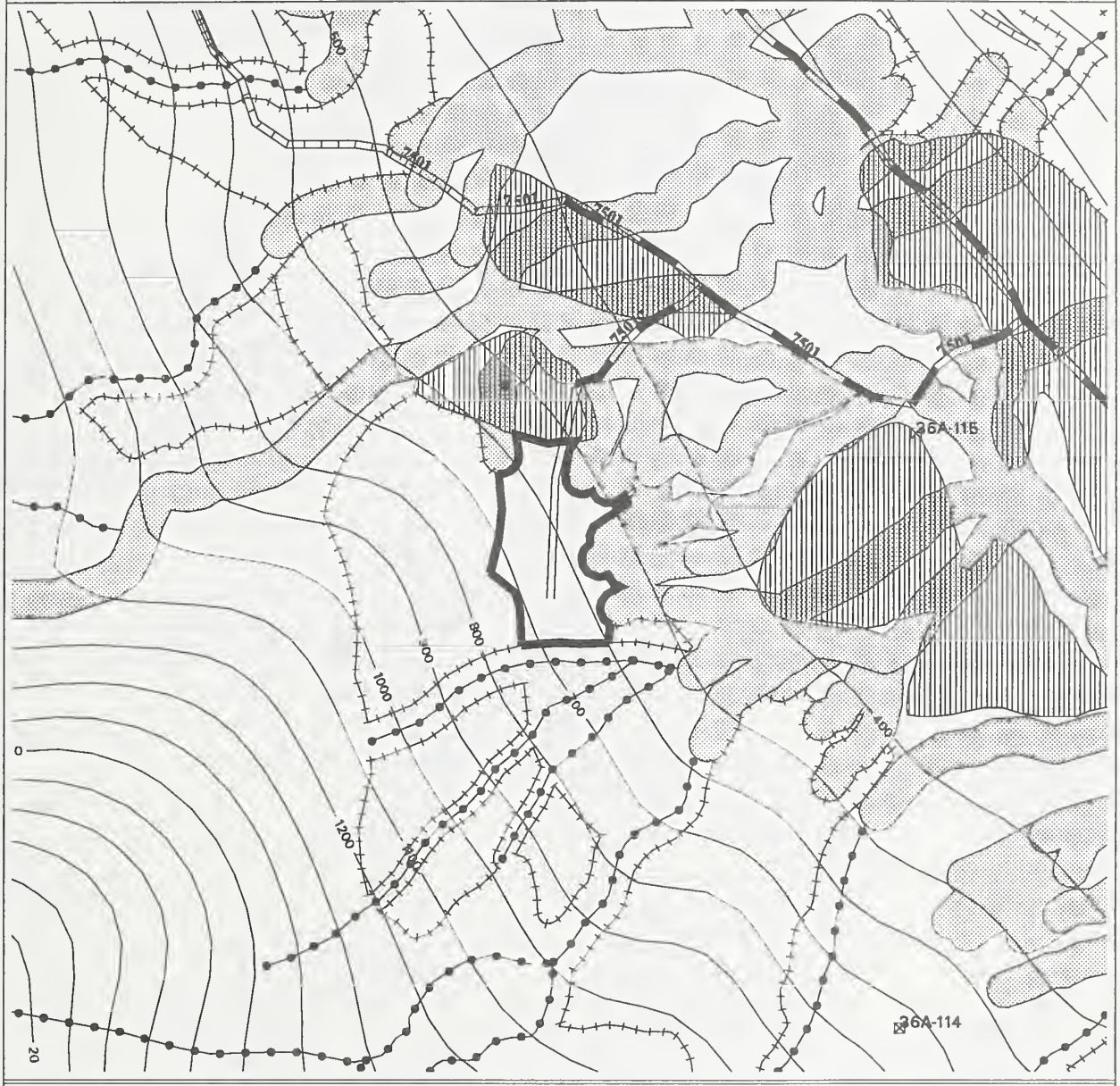
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2810 QUAD(s): SITD4SW

ACRES: 14 Unit 2810 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT--HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 2820 VCU: 2200
ACRES: 58.4 VOLUME (MBF): 1283

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	1219	Helicopter	Clearcut w/ retention
C	95	1219	Helicopter	Clearcut w/ retention
F	95	1219	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams on north end of unit, and category B, Class III streams on S and N boundaries and within unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.; where possible, feather adjacent to stream buffers(remove larger trees, retain nonmerchantable trees) to increase probability of remaining windfirm. The HC5 and HC6 channels within and bordering the unit are category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary on category B streams. For N and S boundary streams, place unit boundary at or above slope break of Class III channels (2/3 rule -- see soils).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a, 13.16. Windfirm boundaries to v-notches (Class III streams).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on north and south boundaries of the unit. Within Class III channels, cut all trees having less than 2/3 of their height lying below the channel slope break (2/3 rule).

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

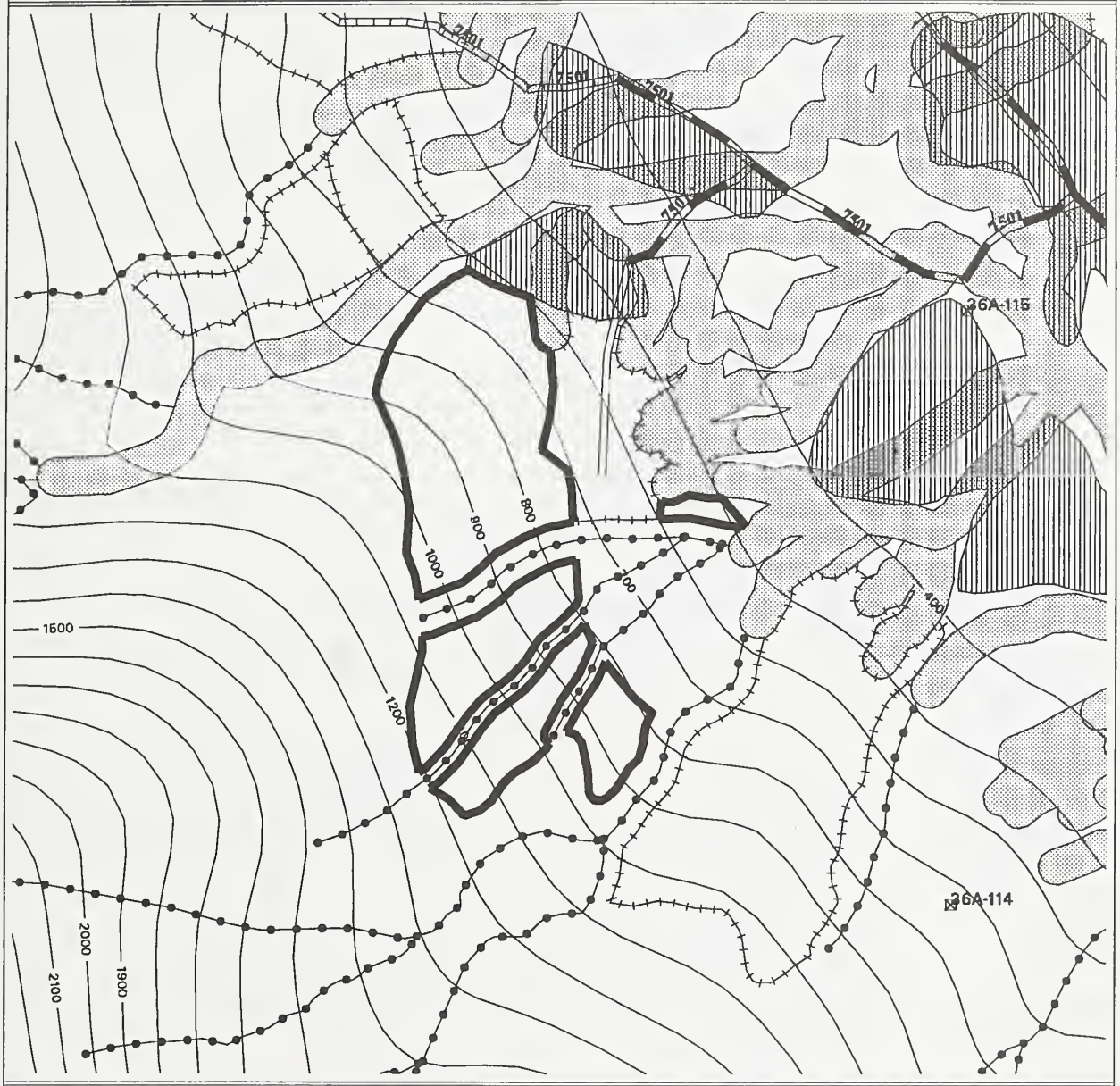
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 2820 QUAD(s): SITD4SW

ACRES: 58 Unit 2820 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 3010 VCU: 2200
ACRES: 13.1 VOLUME (MBF): 225

ALTERNATIVE SUMMARY

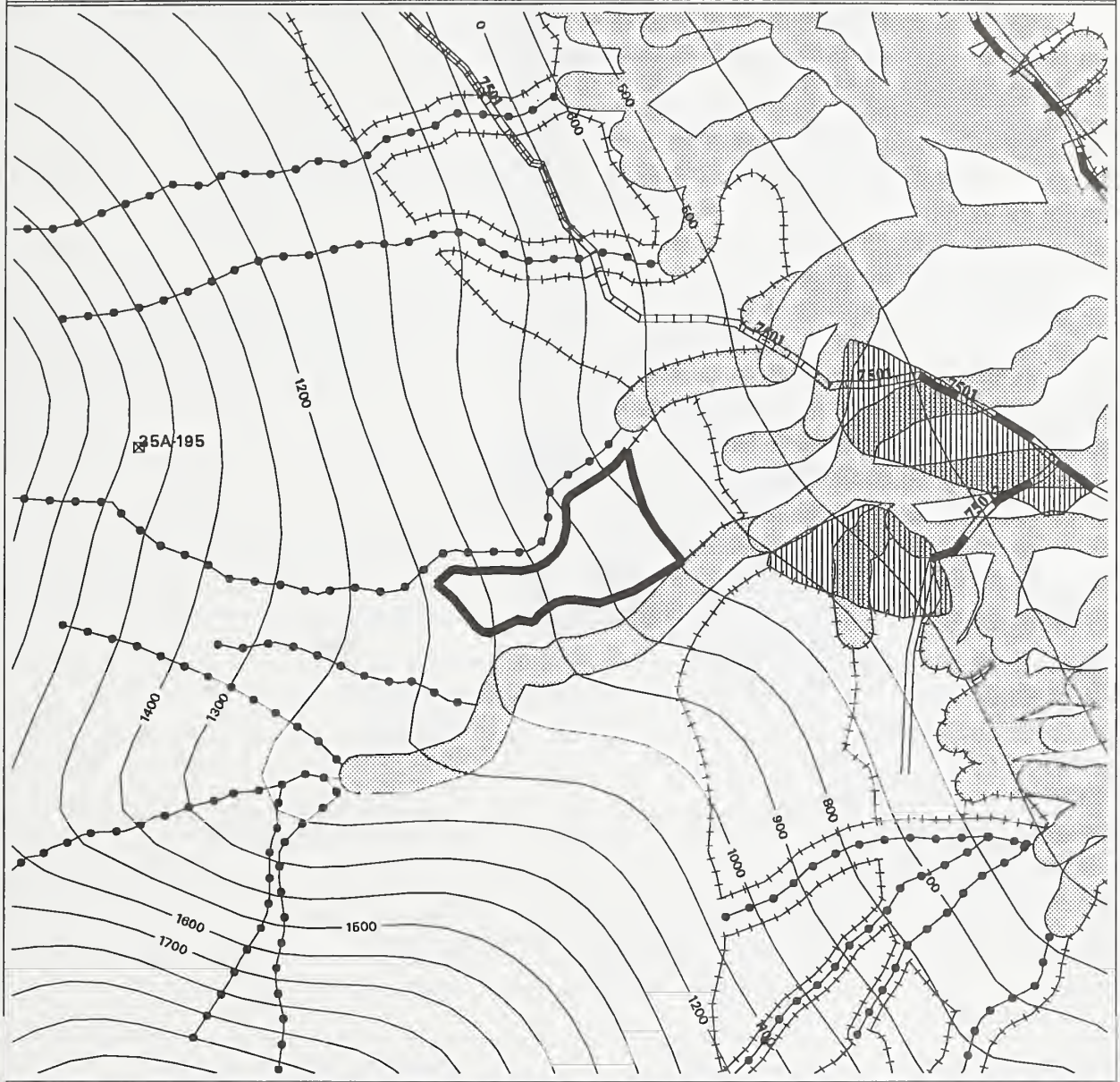
ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	45	Helicopter	Group Selection
F	95	214	Helicopter	Clearcut w/ retention

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain old-growth characteristics.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Deeply incised HC3 and HC6 channels on S and N boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Place unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundaries on both sides, for cc w/retention alternative. (BMP 12.6a; 13.16).
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Recommend group selections or clearcut with windfirm cedar and spruce retention.
{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: Leave windfirm boundary on both sides of the unit for Alt. F (2/3 rule).
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3010 QUAD(s): SITD4SW

ACRES: 13 Unit 3010 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 3020 VCU: 2200
ACRES: 8.5 VOLUME (MBF): 85

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	95	80	Helicopter	Clearcut w/ retention
F	95	80	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Open forested habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower boundary and bordering N and S. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm along north HC2 and south HC3/AF1 boundary streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Windfirm boundaries to streams (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm boundary on both sides of unit.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

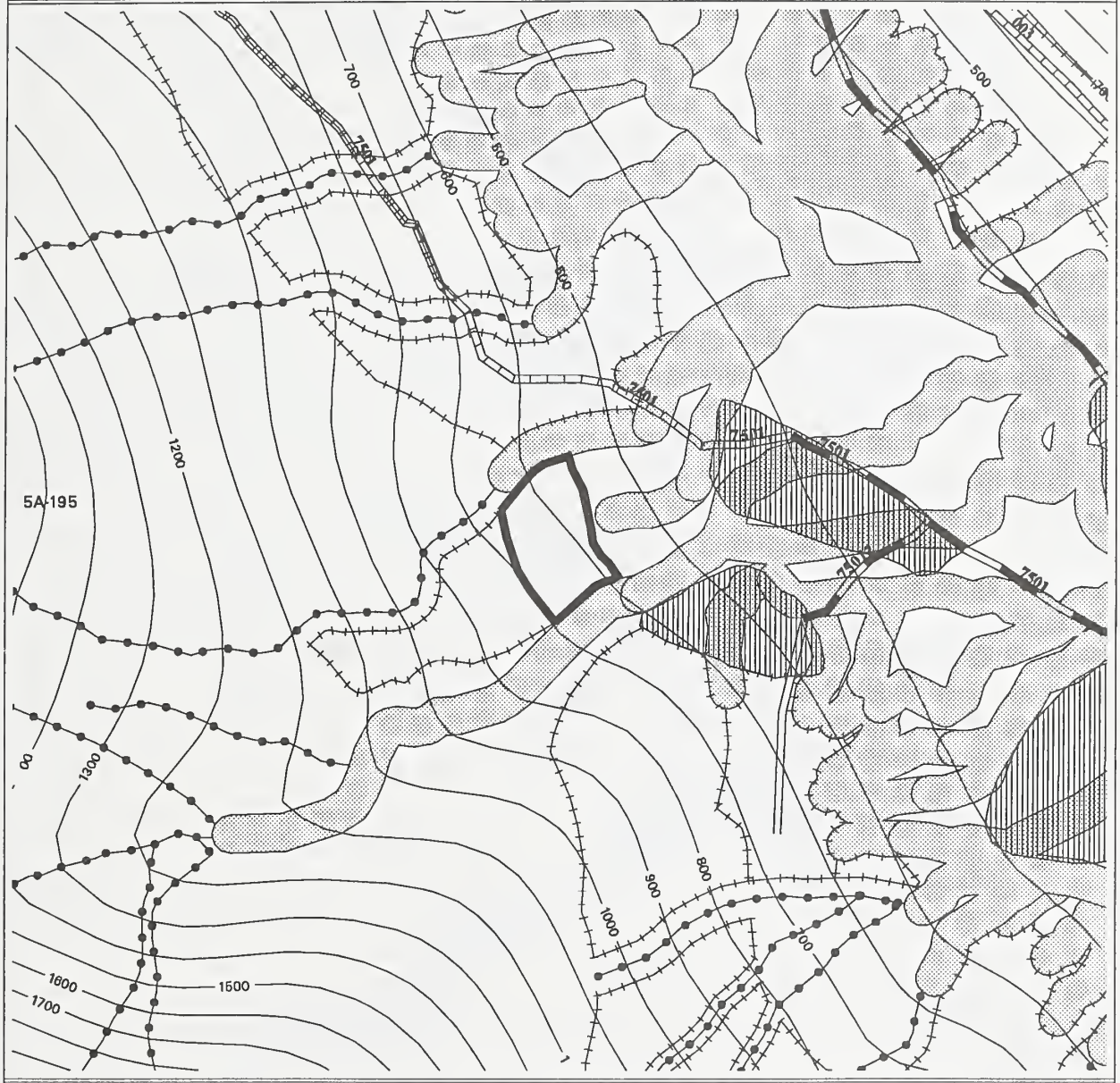
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3020 QUAD(s): SITD4SW

ACRES: 8 Unit 3020 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 3112 VCU: 2200
ACRES: 22.54 VOLUME (MBF): 389

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90/95	72/293	Cable	Clearcut w/ retention
F	90/95	72/293	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along S and lower NE boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm, along N and S boundary streams where possible. Deeply incised HC6 channel on upper 2/3 of N boundary is Class III, category B stream. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break, on this HC6 channel.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Windfirm boundaries to streams (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm boundary on both sides of unit. (See Fisheries)

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Cable yarding.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

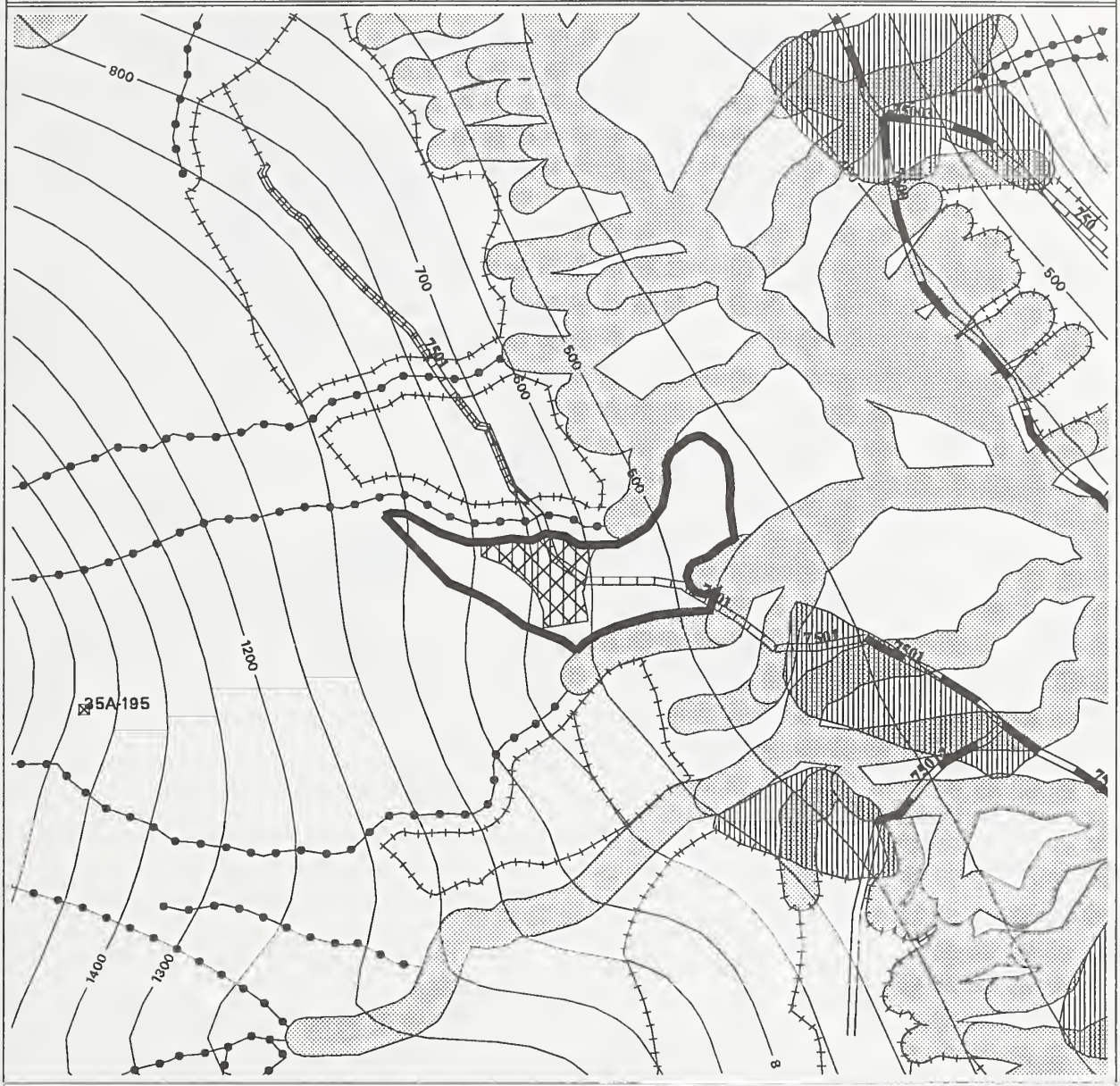
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3112 QUAD(s): SITD4SW

ACRES: 22 Unit 3112 Occurs in Alternatives: C F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT--HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 3212 VCU: 2200
ACRES: 2.3 VOLUME (MBF): 42

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	15	Helicopter	Patch Clearcut

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Open forest habitat; moderate survey priority. Recommend botanist present during layout.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Specialists needed during layout to identify/flag boundaries of category A fish streams (Class II channels) along lower and NW boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Place unit boundary at or above slope break of Class III channels (2/3 rule) for deeply incised HC6 channel on NW boundary. Protect this Class III, category B stream as per BMP 13.16 (and 13.3). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Group selections, overstory removal (70% of volume), or clearcut with retention.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN REMARKS: Combining with unit 3222 and group selections in Alternative B.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3212 QUAD(s): SITD4SW

ACRES: 2 Unit 3212 Occurs in Alternatives: B



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 3221 VCU: 2200
ACRES: 33.0 VOLUME (MBF): 941

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	113/775	Cable	Clearcut w/ retention
C	90/95	113/775	Cable	Clearcut w/ retention
F	90/95	113/775	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Deeply incised HC6 channels on S and NW boundaries and bisecting southern half of unit are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary along Class III channels per 2/3 rule. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class III streams. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Partial suspension.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along Class III channel that bisects unit (2/3 rule).

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3221 QUAD(s): SITD4SW

ACRES: 33 Unit 3221 Occurs in Alternatives: B C F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 3222 VCU: 2200
ACRES: 46.9 VOLUME (MBF): 1108

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	388	Cable	Patch Clearcut
C	35	388	Cable	Patch Clearcut
E	95	1052	Cable	Clearcut w/ retention
F	95	1052	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Open forest muskeg habitat; moderate survey priority. Botanist present during layout.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of category A streams (many Class II) along lower and S boundary and in southern ½ of unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. HC6 channels on S boundary and within southern ½ of unit are Class III, category B streams. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary along Class III channels per 2/3 rule. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Recommend windfirm boundaries to Class III streams. BMP 12.6a, 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend Patch Clearcuts, overstory removal (70% of volume), or clearcut with retention, partial suspension.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along Class III channel that bisects unit in cc alts.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Cable, clearcut, access by a specified road.

{ TRANSPORTATION } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER
REMARKS: No concerns.

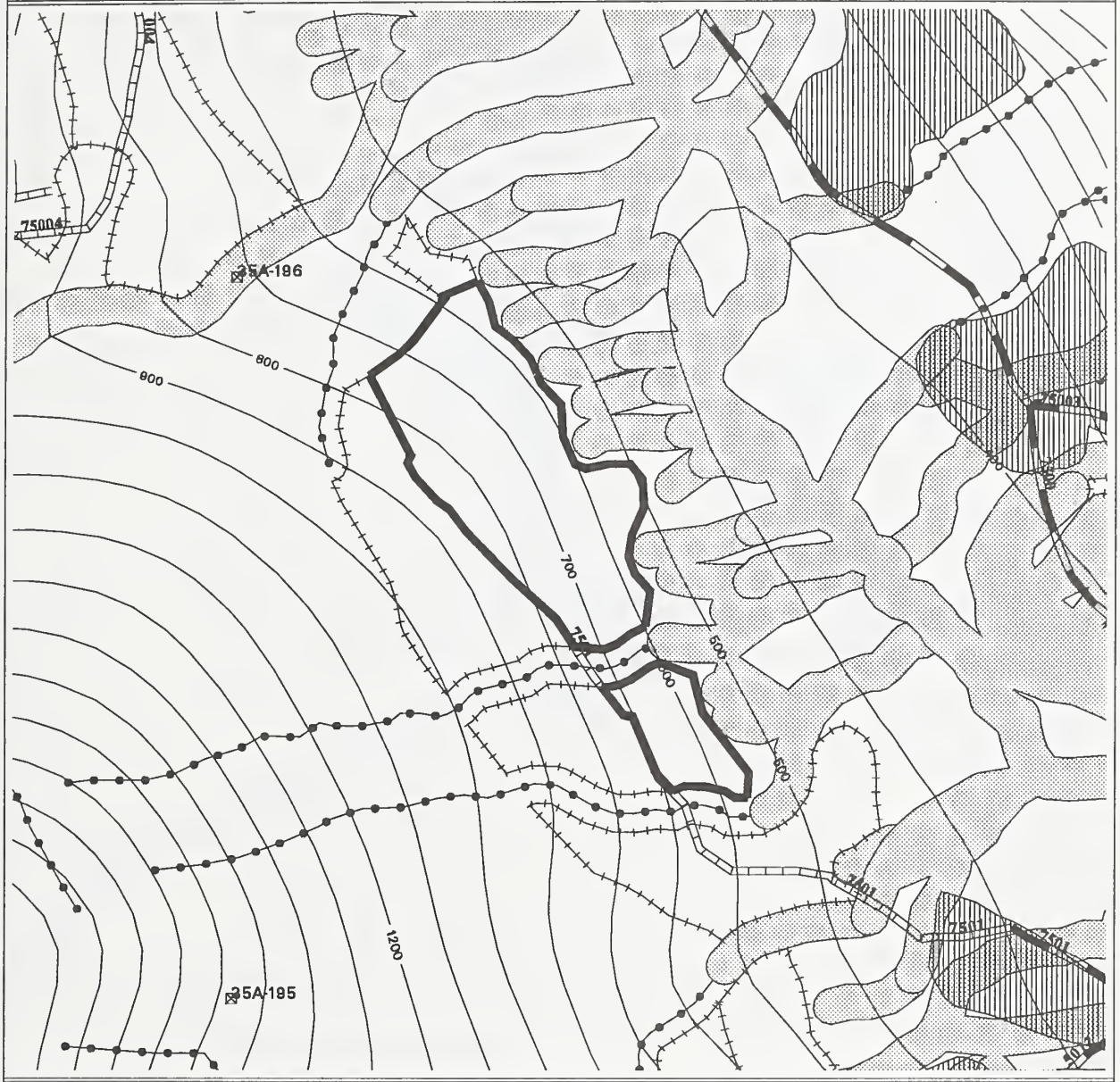
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3222 QUAD(s): SITD4SW

ACRES: 47 Unit 3222 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/99

INDIAN RIVER UNIT CARD

UNIT: 3520 VCU: 2200
ACRES: 30.9 VOLUME (MBF): 613

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	283/285	Helicopter/cable	Clearcut w/ retention
C	90/95	283/285	Helicopter/cable	Clearcut w/ retention
E	90/95	283/285	Helicopter/cable	Clearcut w/ retention
F	90/95	283/285	Helicopter/cable	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Deeply incised HC3 channel on south boundary is Class II, category A fish stream. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to stream channel. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Assuming the unit will be cable, split-yard v-notch in northern end of unit; partial suspension on eastern side of unit. Leave windfirm boundary on southeast side of unit; feather if possible.

{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: G.VIRTUE APPROVED BY: B.CRIDER
REMARKS: Specified road to access unit.

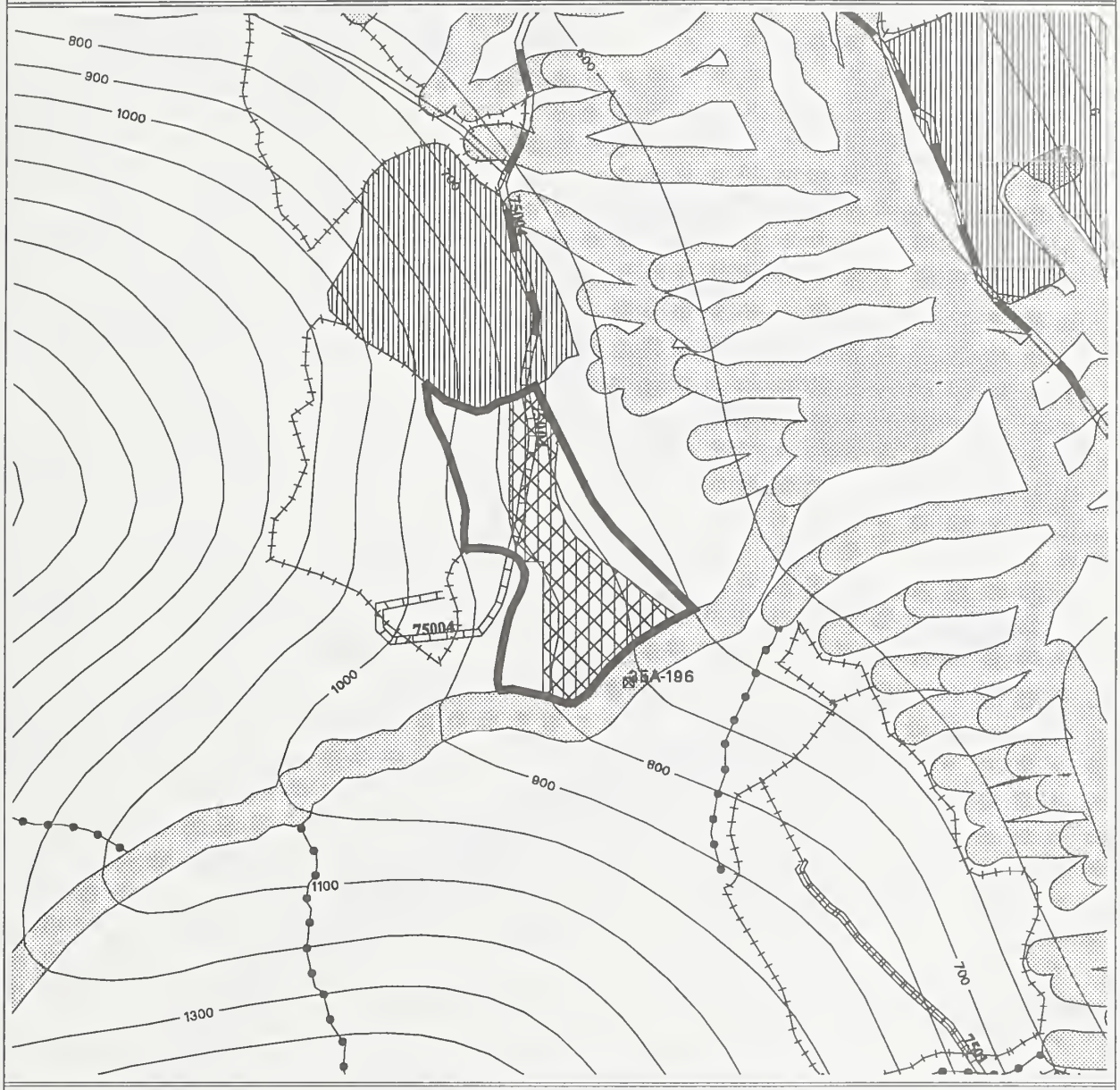
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3520 QUAD(s): SITD4SW

ACRES: 31 Unit 3520 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/98

INDIAN RIVER UNIT CARD

UNIT: 3530 VCU: 2200
ACRES: 32.3 VOLUME (MBF): 717

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	682	Helicopter/Cable	Clearcut w/ retention
C	95	682	Helicopter/Cable	Clearcut w/ retention
E	95	682	Helicopter/Cable	Clearcut w/ retention
F	95	682	Helicopter/Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention, helicopter yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial suspension in center and north end of unit.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Profile slope.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

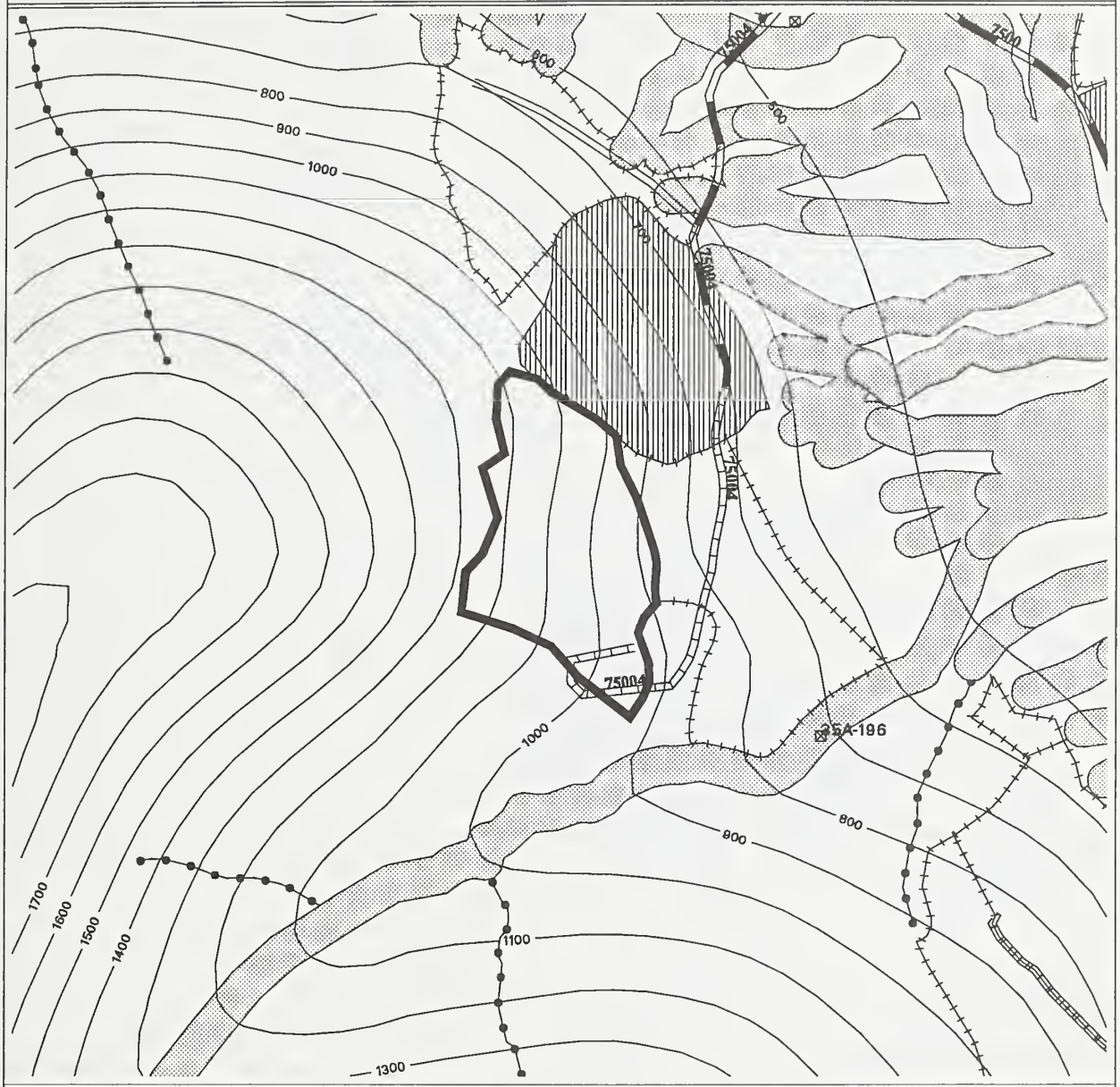
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Red-tailed hawk seen; no nest located. Survey as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3530 QUAD(s): SITD4SW

ACRES: 32 Unit 3530 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1.12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 3610 VCU: 2200
ACRES: 25.7 VOLUME (MBF): 559

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	92/434	Cable	Clearcut w/ retention
C	90/95	92/434	Cable	Clearcut w/ retention
E	90/95	92/434	Cable	Clearcut w/ retention
F	90/95	92/434	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Open forest, subalpine/alpine habitat; moderate survey priority. Botanist present during layout.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of category A fish streams (Class II streams) along lower N and NE boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention, cable yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in southern end of unit.

{ TIMBER } FIELD REVIEW: G.PETERSON L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: Access unit with temporary road.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 3610 QUAD(s): SITD5SE/SITD4SW

ACRES: 26 Unit 3610 Occurs in Alternatives: B C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 4011 VCU: 2200
ACRES: 5.2 VOLUME (MBF): 186

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	38	Shovel	Single Tree Selection
E	20	38	Shovel	Single Tree Selection
F	20	38	Shovel	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Implement buffers on spring fed, Class I, MM1 channel on W boundary as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Partial cut due to blowdown concerns, or clearcut with retention. Regeneration concern, the unit may come back in devil's club. Could Single Tree Selection for 20% of volume to maintain windfirmness.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

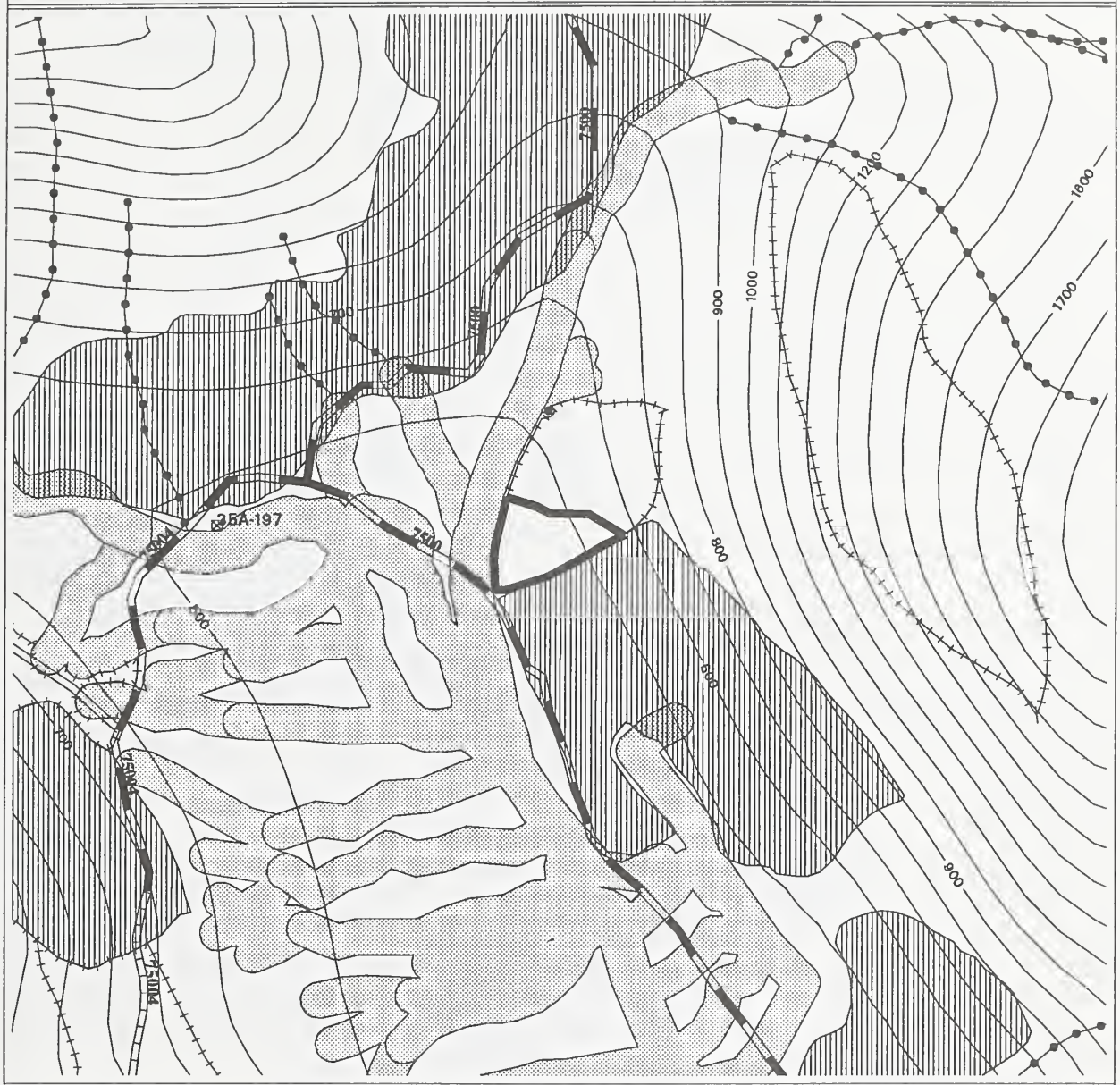
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: High wildlife use. Single Tree Selection will help maintain suitable habitat characteristics. May be an active Red-tailed hawk nest in area. If active Red-tailed hawk nest is located, implement W/L raptor nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C.(Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4011 QUAD(s): SITD4SW

ACRES: 5 Unit 4011 Occurs in Alternatives: C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 4012 VCU: 2200
ACRES: 9.2 VOLUME (MBF): 265

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	53	Helicopter	Single Tree Selection
E	20	53	Helicopter	Single Tree Selection
F	20	53	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Implement buffers on spring fed, Class I, MM1 channel on W boundary as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in NW corner and along W boundary.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Partial cut due to blowdown concerns, or clearcut with retention. Regeneration concern, the unit may come back in devil's club. Could single tree select for 20% of volume to maintain windfirmness.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

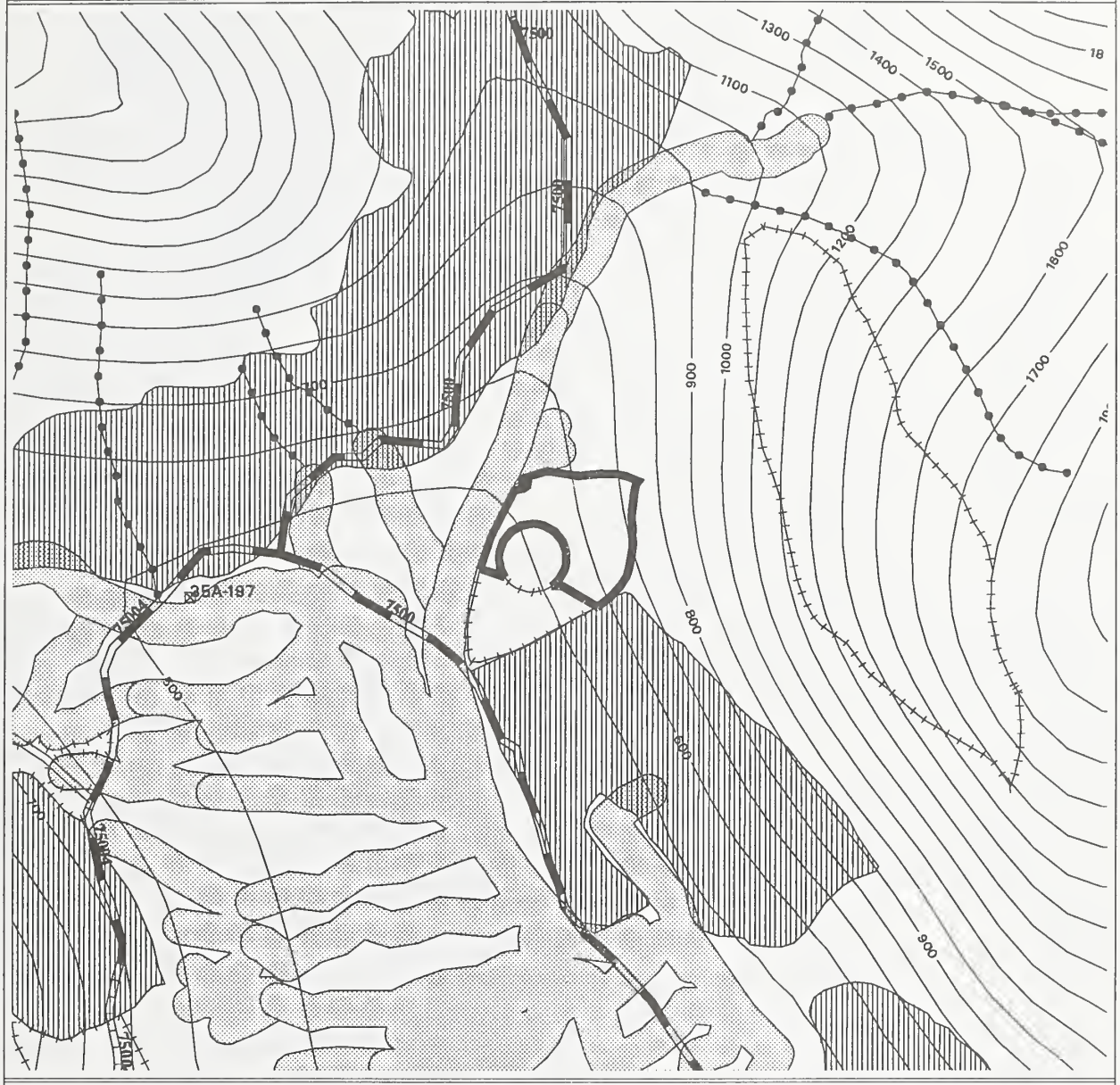
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: High wildlife use. Single Tree Selection will help maintain suitable habitat characteristics. May be an active Red-tail hawked nest in area. If active Red-tailed hawk nest is located, implement W/L raptor nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C.(Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4012 QUAD(s): SITD4SW

ACRES: 9 Unit 4012 Occurs in Alternatives: C E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 4120 VCU: 2200
ACRES: 58.2 VOLUME (MBF): 1064

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	1010	Helicopter	Clearcut w/ retention
C	95	1010	Helicopter	Clearcut w/ retention
D	95	1010	Helicopter	Clearcut w/ retention
E	95	1010	Helicopter	Clearcut w/ retention
F	95	1010	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology for water quality concerns on N boundary stream.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention due to decadence.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter yarding.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

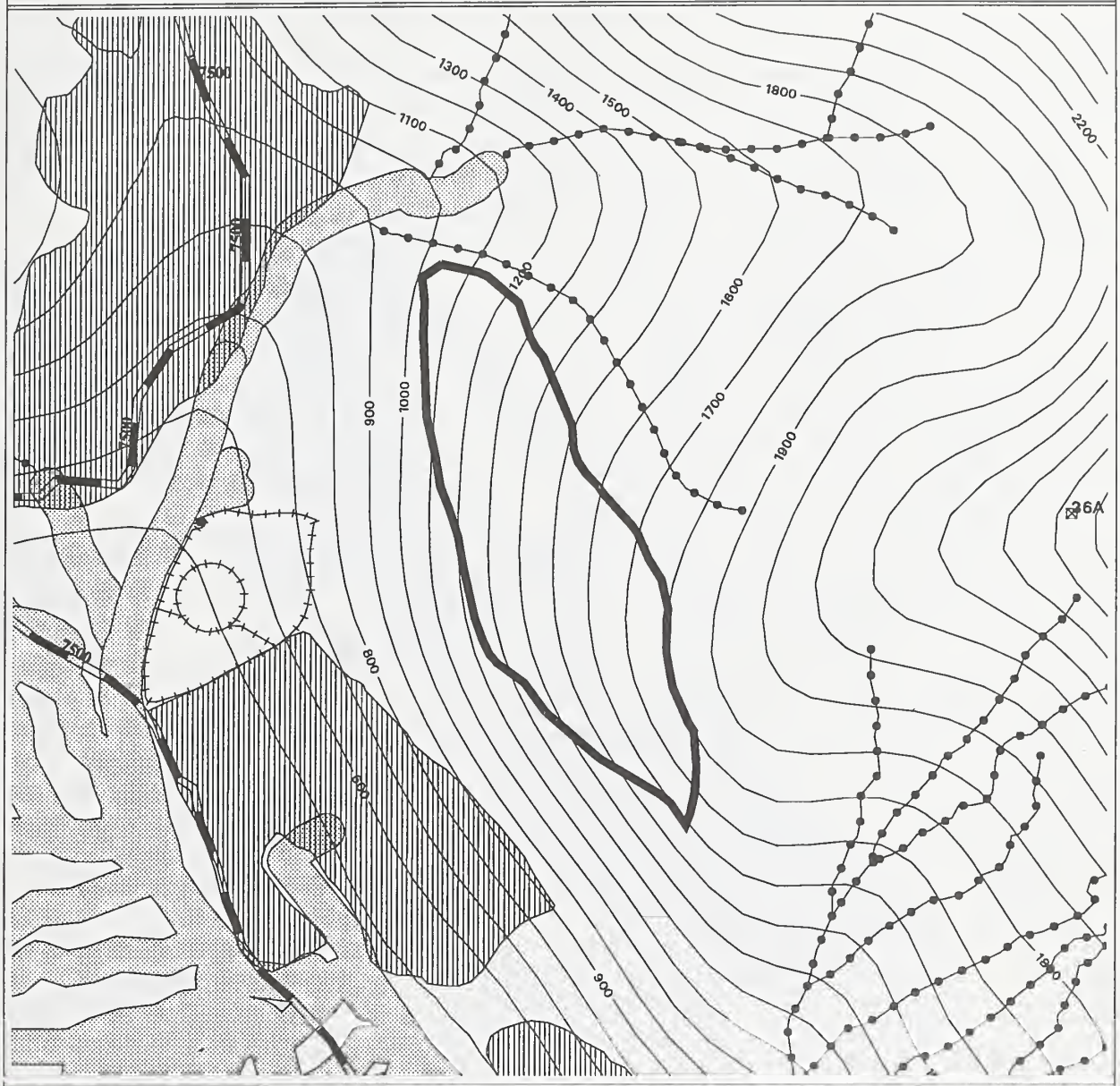
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4120 QUAD(s): SITD4SW

ACRES: 58 Unit 4120 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 4420 VCU: 2200
ACRES: 38.2 VOLUME (MBF): 1105

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	1049	Cable	Clearcut w/ retention
F	95	1049	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics. Cable yarding.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower boundary and N and S boundaries, and a number of Class IV category C streams that continue uphill from the small Class I streams. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Protect category C streams (BMP 13.16 and 13.3). Leave windfirm boundary (especially on S side of buffers which face prevailing winds) on AF1/HC6 stream in middle of unit and HC2/HC6 stream on S boundary. Where possible, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm. HC6 channels in upper middle and S boundary of unit are Class III, category B streams. Protect per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm leave strip on central Class III stream. (BMP 12.6a; 13.16)

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention due to high blowdown potential and stand decadence.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along Class III channel bisecting unit. (See fisheries)

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

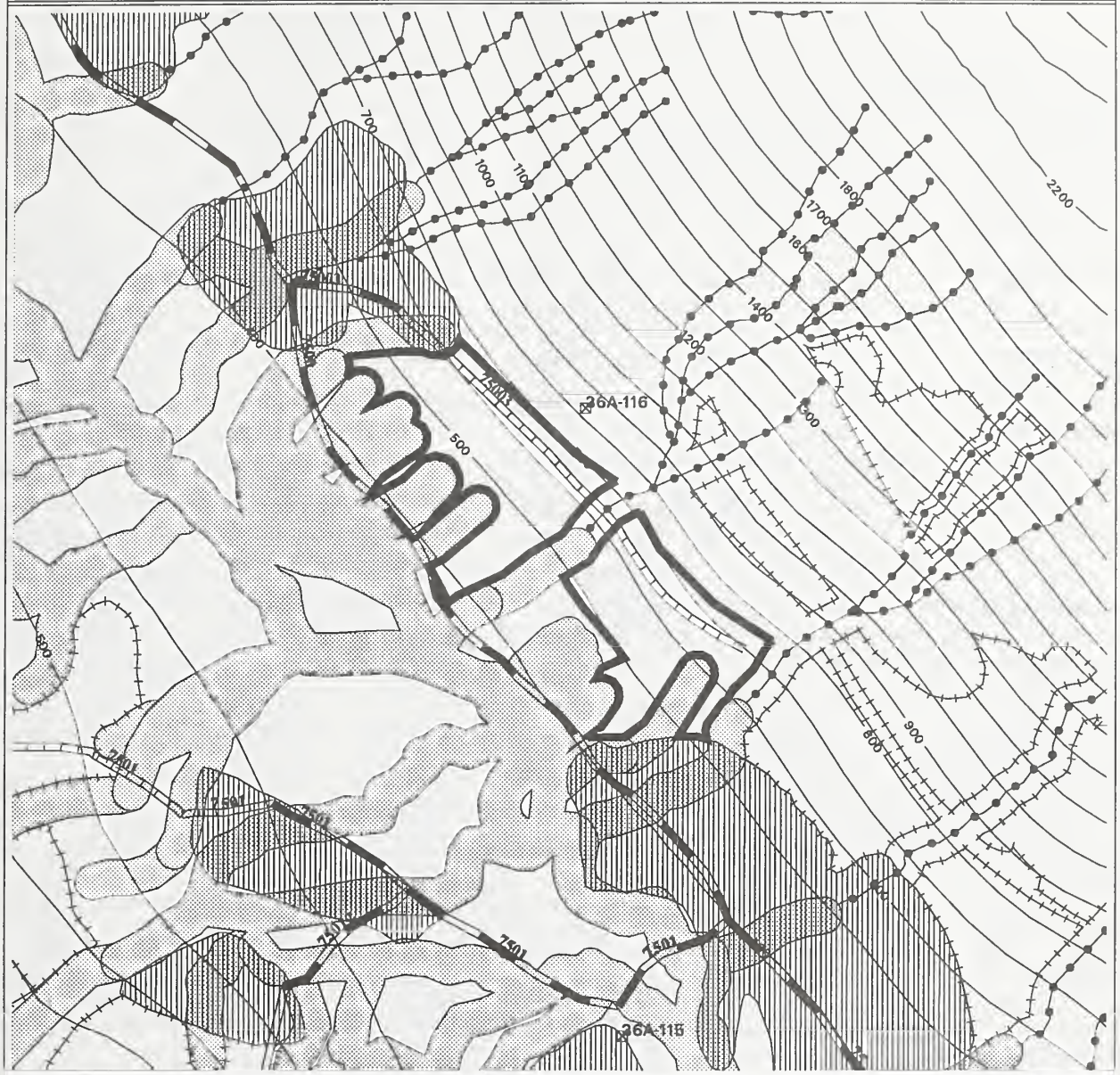
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Buffers provide vertical travel corridor. Creates large opening when adjacent clearcuts are considered. Implement W/L 200 year or greater rotation length S&G IV.C.(Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4420 QUAD(s): SITD4SW

ACRES: 38 Unit 4420 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 4440 VCU: 2200
ACRES: 19.0 VOLUME (MBF): 388

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	35	136	Helicopter	Patch Clearcut
F	95	368	Helicopter	Clearcut w/ retention

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Subalpine/alpine habitat. Low survey priority.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: See hydrology and soils for remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundaries to Class III stream channels for cc w/retention alt. (BMP 12.6a; 13.16).
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: Clearcut with retention.
{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: Leave windfirm boundary along boundaries and Class III channels within unit.
{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN REMARKS: Make boundary as windfirm as possible.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Survey for herons. If active nest is located, implement W/L heron nest S&G X.A.1-3.Implement W/L 200 year or greater rotation S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4440 QUAD(s): SITD4SW

ACRES: 19 Unit 4440 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/01/98

INDIAN RIVER UNIT CARD

UNIT: 4620 VCU: 2200
ACRES: 60.9 VOLUME (MBF): 1690

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
F	80	1352	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW:JACOBSON/KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams on lower end of SE and NW boundary streams. Leave windfirm (against prevailing SE storm winds) boundary on large HC6, Category B channels on NW and SE boundaries and in middle of unit. Protect Class III,IV Category B and C streams as per BMP 13.16.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class II stream channels. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Overstory removal > 16 inches dbh for 80% of volume; buffers on V-notches.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm boundary on V-notch along southeast boundary of unit. Create windfirm leave strip along Class III channel within unit.

{ TIMBER } FIELD REVIEW: L.WINN, M.REGAN APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: Helicopter harvest.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Survey for herons. If active nest is located, implement W/L heron nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4620 QUAD(s): SITD4SW

ACRES: 61 Unit 4620 Occurs in Alternatives: F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 4710 VCU: 2200
ACRES: 18.7 VOLUME (MBF): 713

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
F	20	143	Shovel	Single Tree Selection

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain old-growth characteristics.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Maintain windfirmness of main channel FP4 (riparian buffer) across road from lower boundary. HC2/HC6 stream on NW boundary and AF1/HC6 stream on E boundary are Class III, category C and B streams. Protect per BMP 13.16 (and 13.3) and TLMP guidelines.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Mistletoe. Single Tree Selection, shovel yarding.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN REMARKS: Shovel yarding.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY REMARKS: Single Tree Selection will help maintain suitable habitat characteristics. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4710 QUAD(s): SITD4SW

ACRES: 19 Unit 4710 Occurs in Alternatives: F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 4910 VCU: 2200
ACRES: 35.5 VOLUME (MBF): 943

ALTERNATIVE SUMMARY

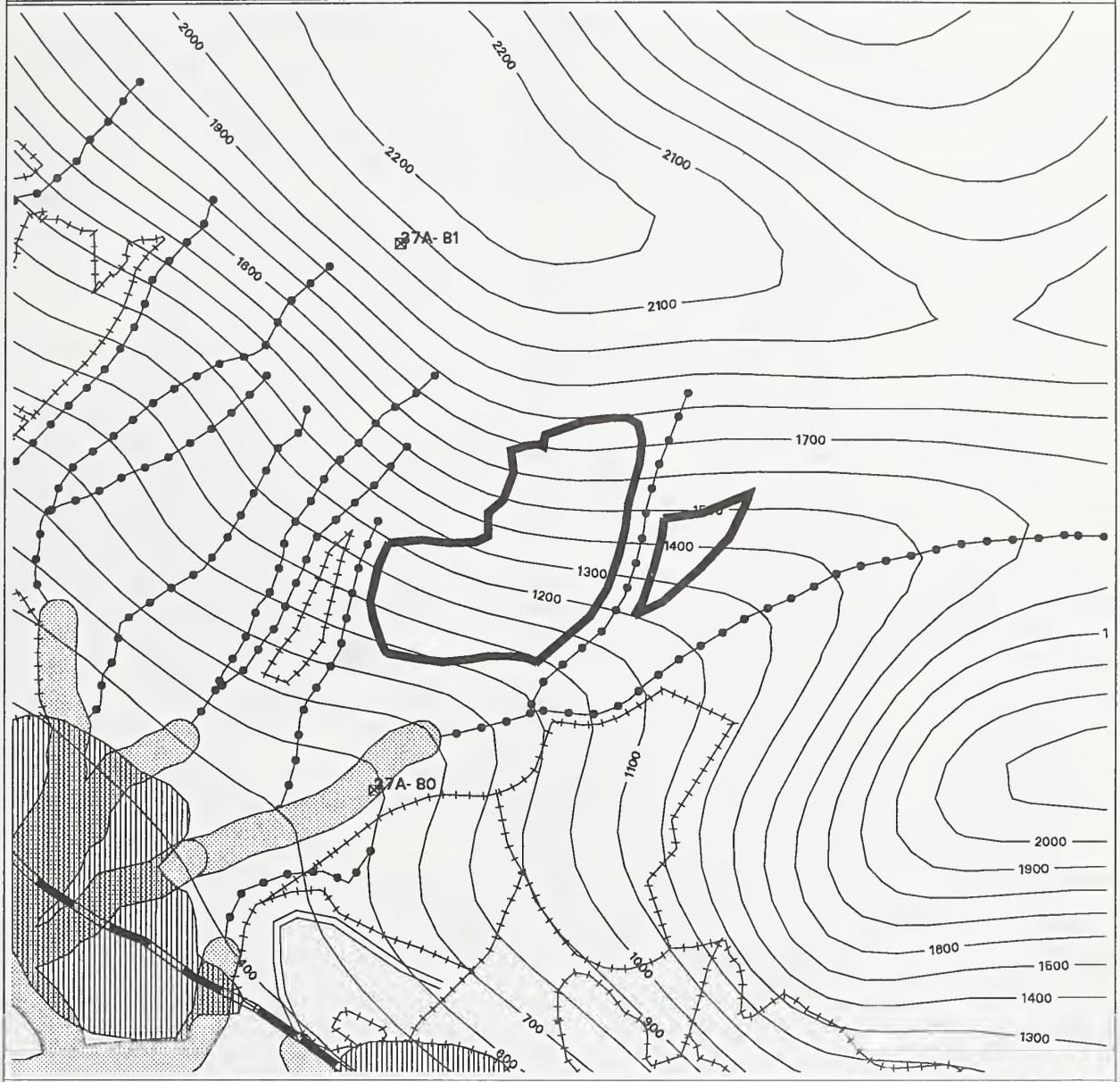
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
F	95	896	Helicopter	Clearcut w/ retention

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Alpine/subalpine habitat; moderate survey priority. Botanist present during layout.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain adequate wildlife corridors.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: See soils and hydrology for remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundary to Class III stream. (BMP 12.6a; 13.16).
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: No concern.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Leave windfirm boundary on east side of unit.
{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN REMARKS: Clearcut, helicopter harvest.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: Maintain wildlife corridors along buffers and unharvested areas. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 4910 QUAD(s): SITD4SW

ACRES: 35 Unit 4910 Occurs in Alternatives: F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 5010 VCU: 2200
ACRES: 14.1 VOLUME (MBF): 258

ALTERNATIVE SUMMARY

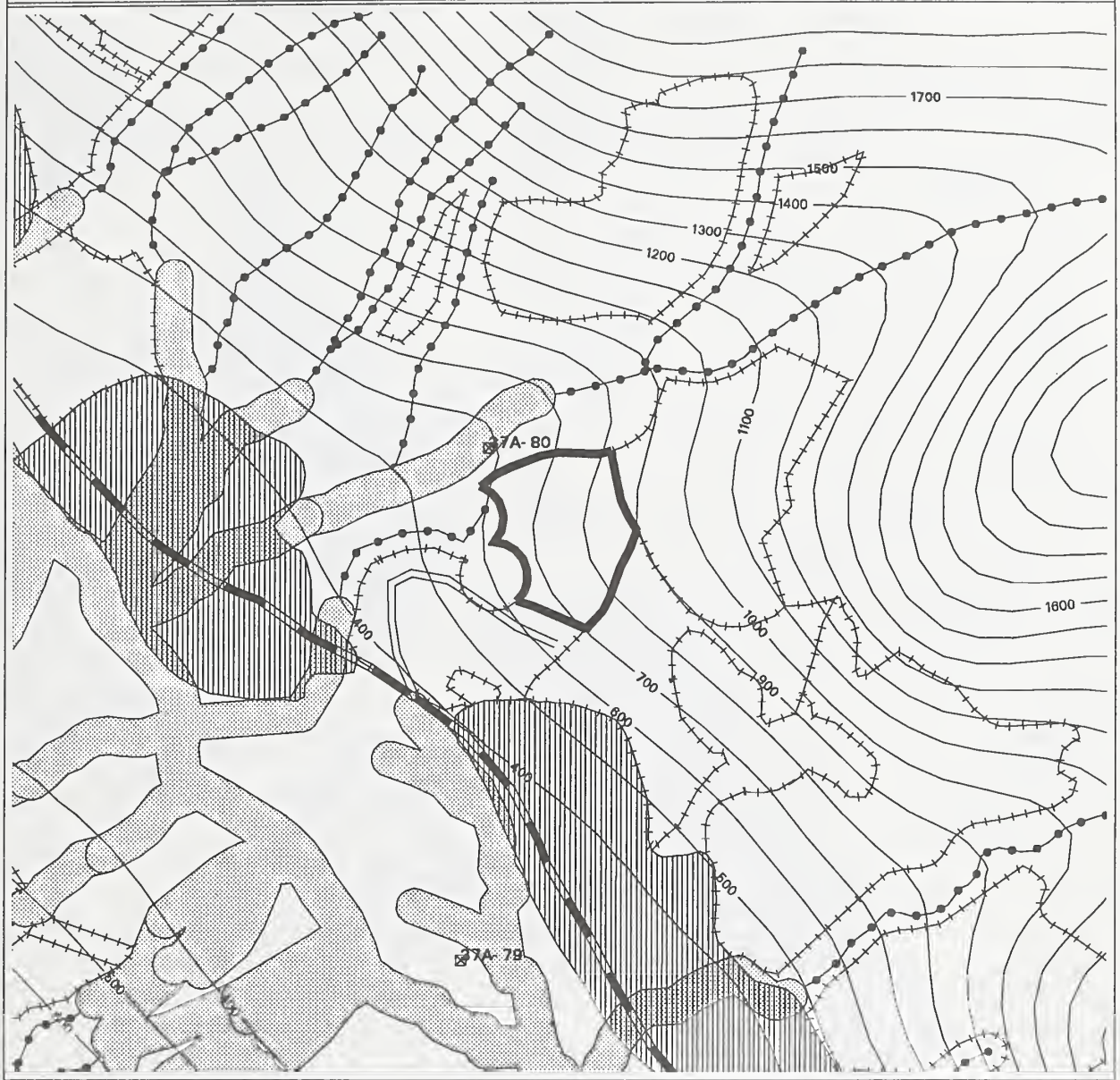
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	180	Helicopter	Overstory Removal
F	35	91	Helicopter	Patch Clearcut

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: No concerns.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5010 QUAD(s): SITD4SW

ACRES: 14 Unit 5010 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 5011 VCU: 2200
ACRES: 16.8 VOLUME (MBF): 440

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	307	Shovel	Overstory Removal
F	35	154	Shovel	Patch Clearcut

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain old-growth characteristics.
{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: No concerns.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN REMARKS: No concerns.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5011 QUAD(s): SITD4SW

ACRES: 17 Unit 5011 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 5020 VCU: 2200
ACRES: 29.7 VOLUME (MBF): 392

ALTERNATIVE SUMMARY

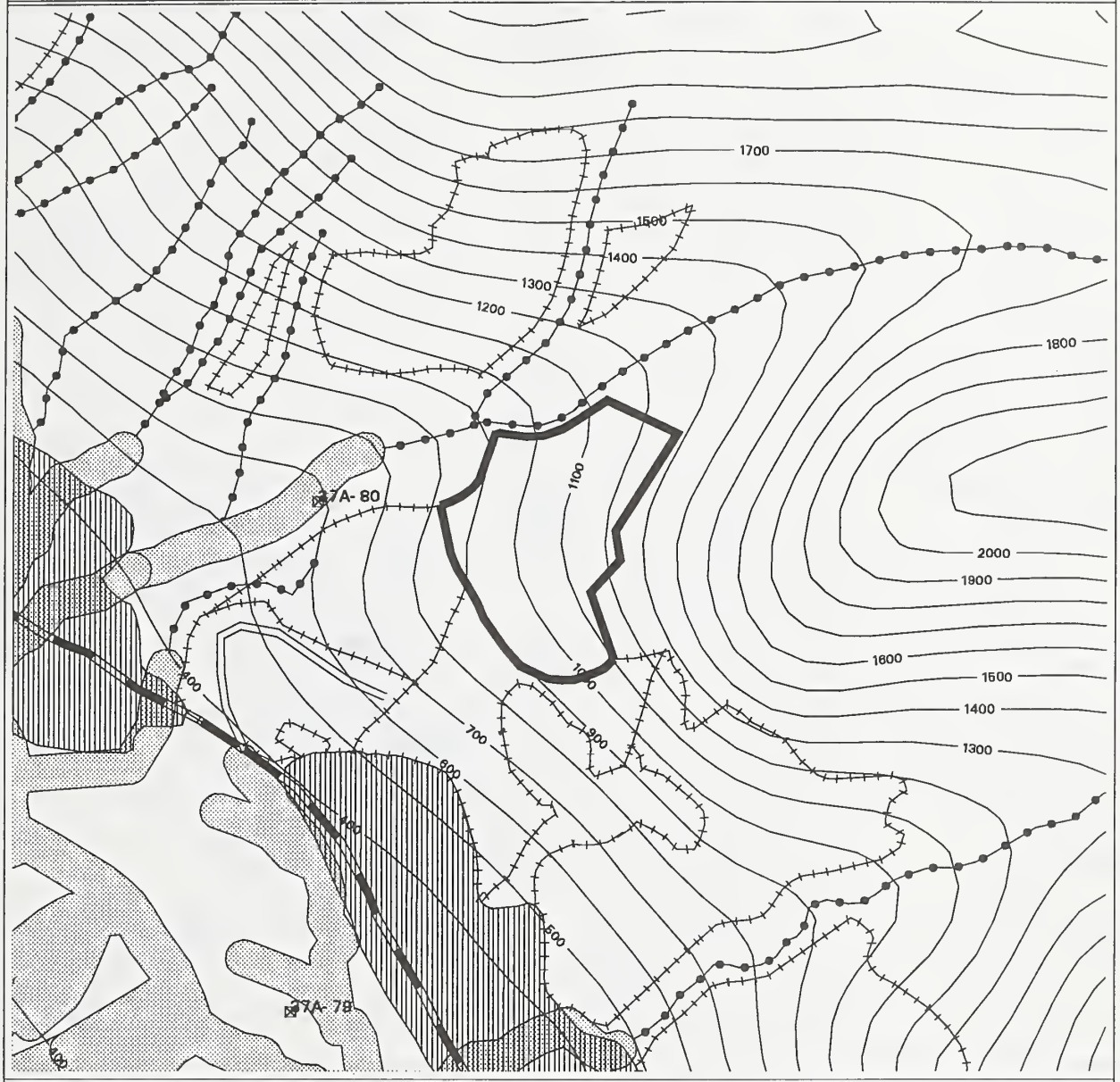
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	275	Helicopter	Overstory Removal
F	35	137	Helicopter	Patch Clearcut

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain old-growth characteristics.
{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: See hydrology for remarks.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundary to Class III stream for Alternative B. (BMP 12.6a; 13.16).
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5020 QUAD(s): SITD4SW

ACRES: 30 Unit 5020 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 5040 VCU: 2200
ACRES: 45.3 VOLUME (MBF): 812

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	772	Helicopter	Clearcut w/ retention
E	95	772	Helicopter	Clearcut w/ retention
F	95	772	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower SW corner of unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary on deeply incised, Class III, category B stream on SE boundary. Protect as per BMP 13.16 (and 13.3). Where a buffer is left along channel, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.(See Fisheries)

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

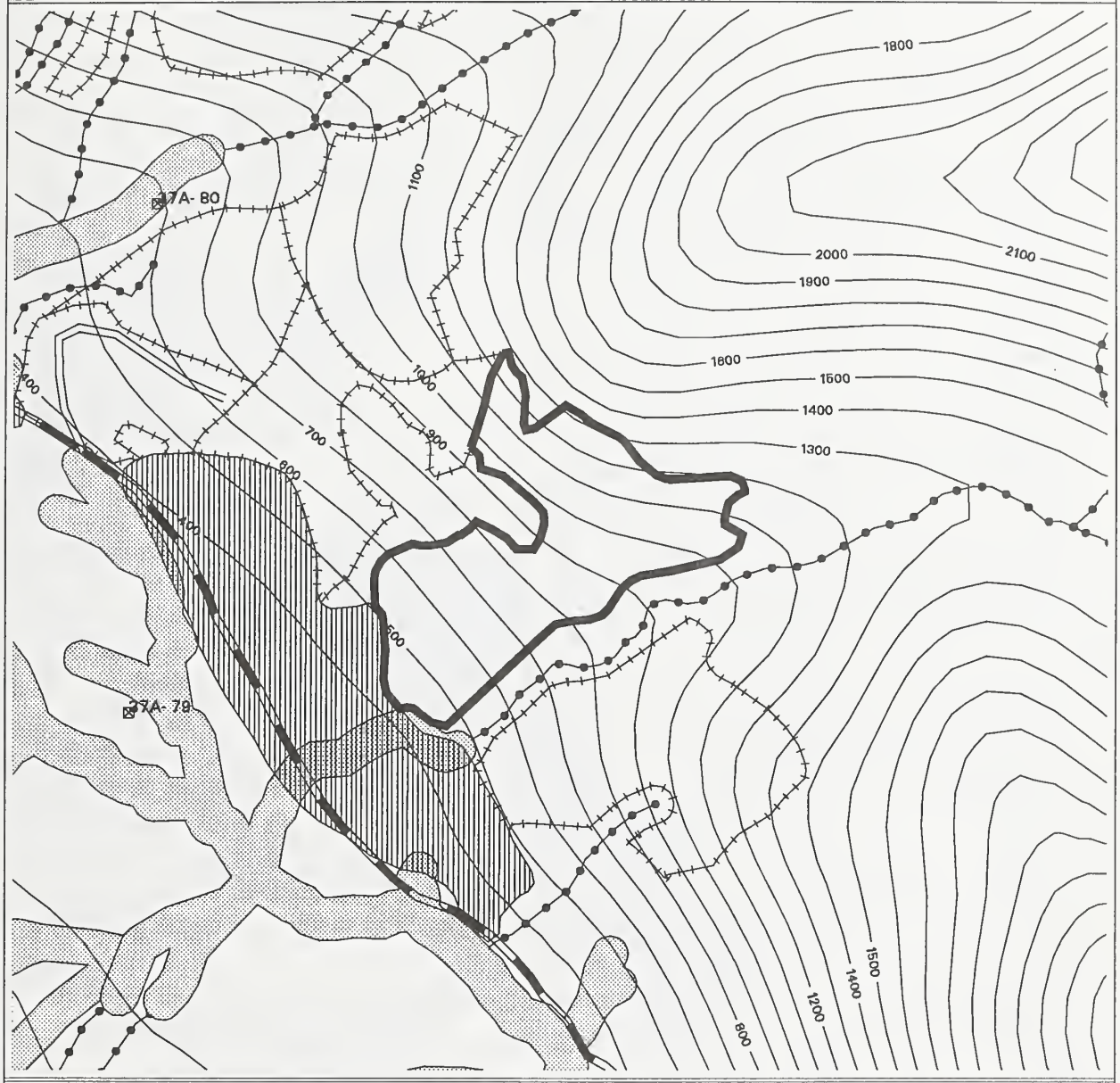
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5040 QUAD(s): SITD4SW

ACRES: 45 Unit 5040 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 5/12/98

INDIAN RIVER UNIT CARD

UNIT: 5080 VCU: 2200
ACRES: 23.8 VOLUME (MBF): 395

ALTERNATIVE SUMMARY

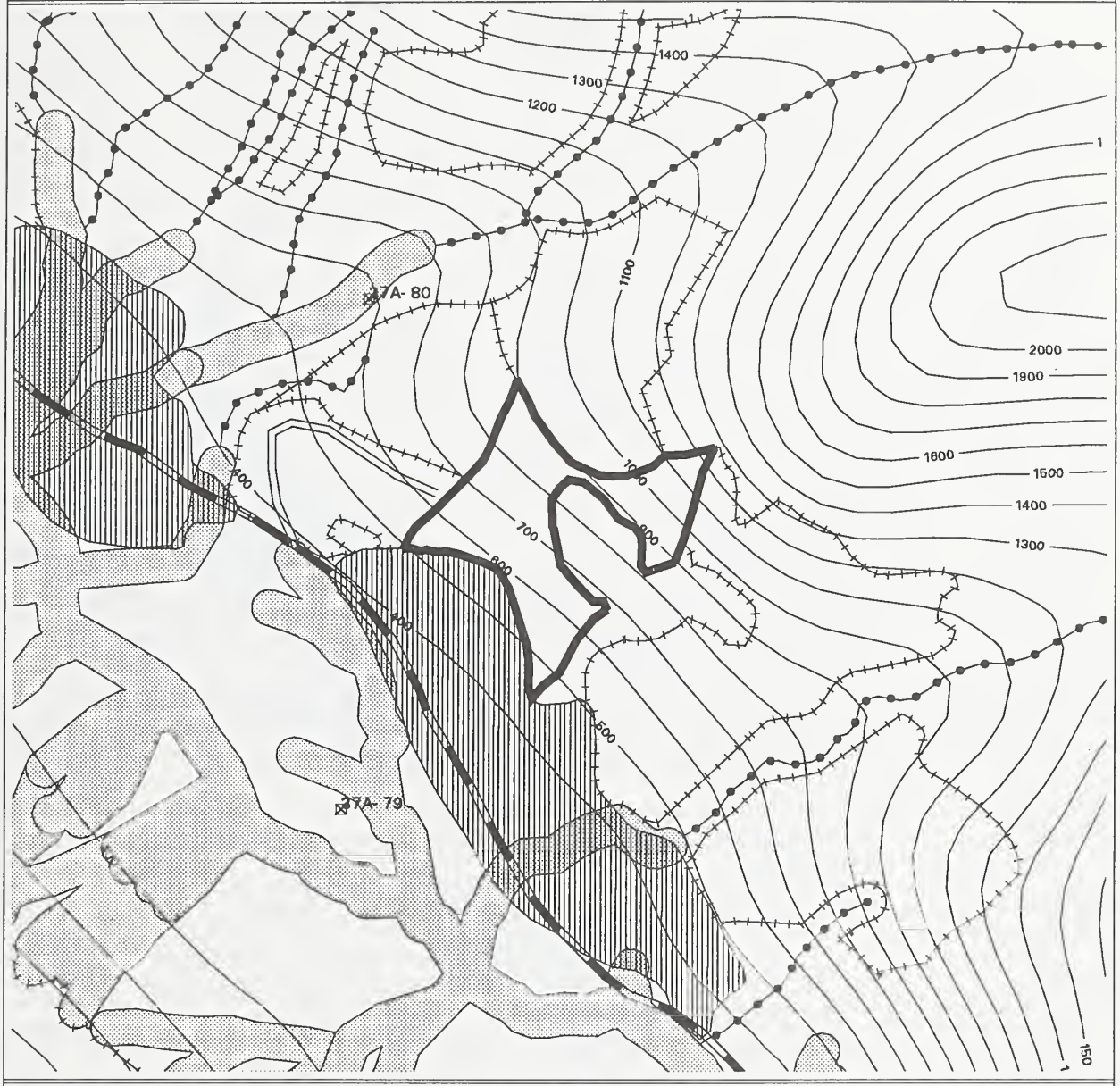
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	316	Helicopter	Overstory Removal
F	35	138	Helicopter	Patch Clearcut

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL REMARKS: Slide and swale habitat. No sensitive plants found in survey.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: Maintain old-growth characteristics.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: No concerns.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: No concerns.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ TIMBER } FIELD REVIEW: G.PETERSON, M.REGAN APPROVED BY: M.REGAN REMARKS: Helicopter harvest.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5080 QUAD(s): SITD4SW

ACRES: 24 Unit 5080 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/98

INDIAN RIVER UNIT CARD

UNIT: 5220 VCU: 2200
ACRES: 34.6 VOLUME (MBF): 597

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	120	Helicopter	Group Selection
E	20	120	Helicopter	Group Selection
F	35	209	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Subalpine habitat; low survey priority.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: For stream at extreme NW corner, maintain buffer as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary on deeply incised, Class III, category B stream along NW/N boundary. Protect as per BMP 13.16 (and 13.3). Where a buffer is left along channel, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Group selection to meet wildlife objectives.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: See Fisheries.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Cliffs. Clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

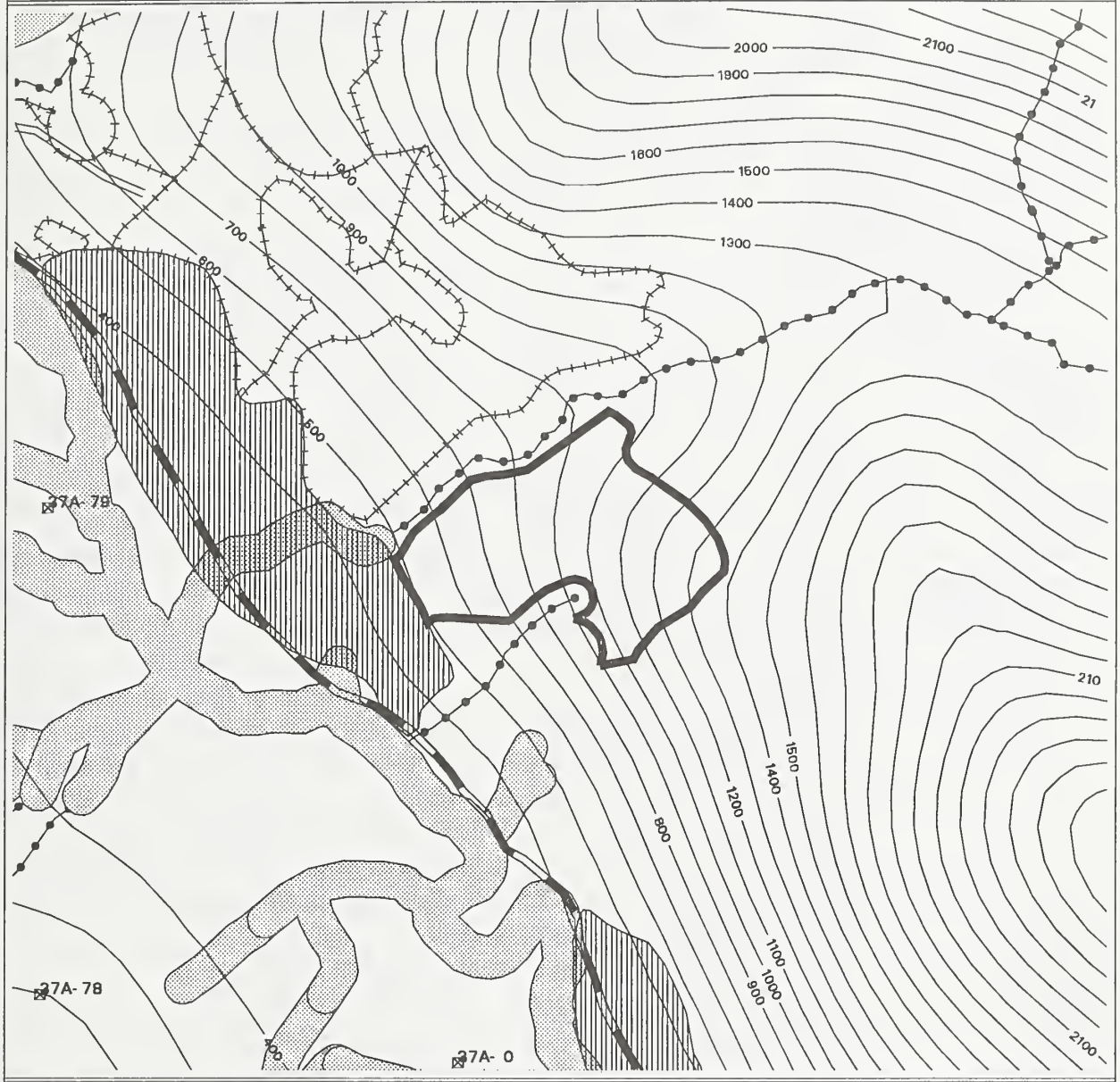
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Group selection will help maintain suitable vertical and horizontal travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5220 QUAD(s): SITD4SW

ACRES: 35 Unit 5220 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 5410 VCU: 2200
ACRES: 19.5 VOLUME (MBF): 334

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	95	318	Helicopter	Clearcut w/ retention
F	95	318	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Blowdown. Recommend clearcut, or group selection, or Single Tree Selection. Helicopter harvest.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5410 QUAD(s): SITD4SW

ACRES: 20 Unit 5410 Occurs in Alternatives: E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 5840 VCU: 2200
ACRES: 2.7 VOLUME (MBF): 76

ALTERNATIVE SUMMARY

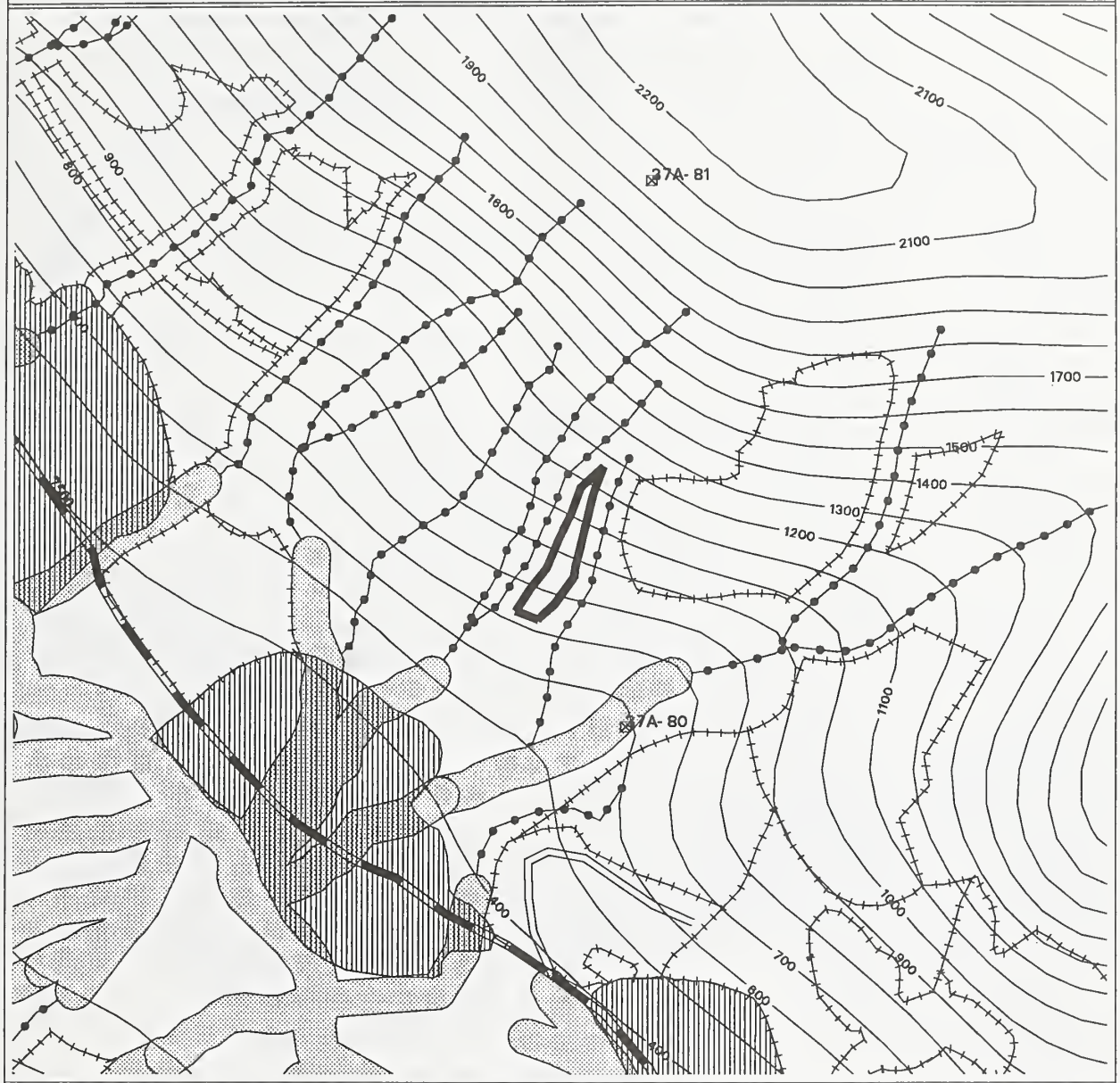
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	53	Helicopter	Overstory Removal
F	70	53	Helicopter	Overstory Removal

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: See soils and hydrology for remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundary to west side Class III stream. (BMP 12.6a; 13.16).
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Blowdown, mistletoe, regeneration. Helicopter harvest, overstory removal > 16 inches dbh due to old blowdown and good regeneration in the unit. Intent is to maintain root strength by leaving green trees in the unit.
{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: Leave 30% of stand to help maintain soil stability.
{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN REMARKS: Helicopter harvest.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2200 UNIT NUMBER: 5840 QUAD(s): SITD4SW

ACRES: 3 Unit 5840 Occurs in Alternatives: B F



Plotted 04/2098

INDIAN RIVER UNIT CARD

UNIT: 20510 VCU: 2221
ACRES: 16.6 VOLUME (MBF): 268

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	254	Helicopter	Clearcut w/ retention
C	95	254	Helicopter	Clearcut w/ retention
D	95	254	Helicopter	Clearcut w/ retention
E	95	254	Helicopter	Clearcut w/ retention
F	95	254	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut, helicopter yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

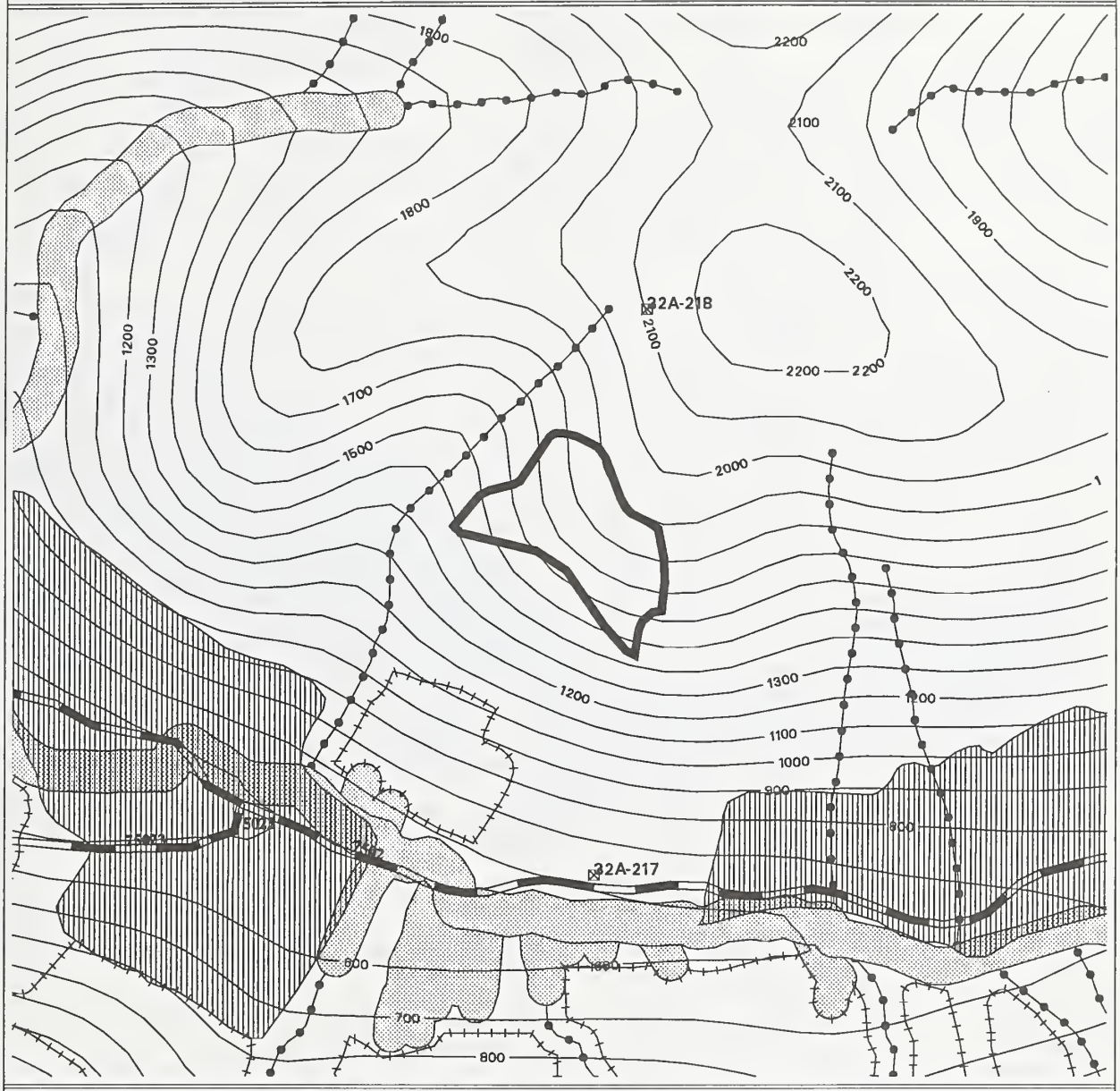
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20510 QUAD(s): SITD5NE

ACRES: 17 Unit 20510 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

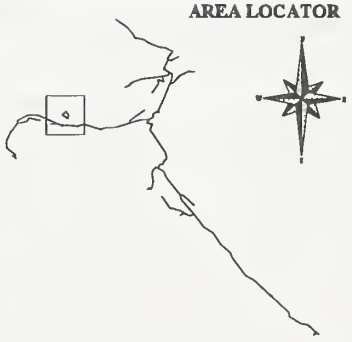
EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/2019

INDIAN RIVER UNIT CARD

UNIT: 20610 VCU: 2221
ACRES: 13.7 VOLUME (MBF): 237

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	190	Helicopter	Overstory Removal
C	80	190	Helicopter	Overstory Removal
D	80	190	Helicopter	Overstory Removal
E	80	190	Helicopter	Overstory Removal
F	80	190	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams in lower SW of unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Existing blowdown along HC6 channel on W boundary is a concern. Leave windfirm boundary along this Class III, category B stream, and protect per BMP 13.16 (and 13.3). Remove all large trees and leave smaller ones along the HC6 channel to maintain a windfirm stream bank. Deeply incised, Class III channel in middle of unit (one of the two that are Class II in lower end of unit) is a category B stream. Protect per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20610 QUAD(s): SITD5NE

ACRES: 14 Unit 20610 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 20710 VCU: 2221
ACRES: 10.7 VOLUME (MBF): 86

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	43	Cable	Single Tree Selection
C	50	43	Cable	Single Tree Selection
D	50	43	Cable	Single Tree Selection
E	50	43	Cable	Single Tree Selection
F	50	43	Cable	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: HC3 channel on E is category B stream. Protect as per BMP 13.16 (and 13.3), and leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to east side stream to protect from northwest wind. (BMP 12.6a; 13.16). Windfirm boundaries can be established by feathering buffer or harvesting trees with 1/3 or more of length above slope break to stream channel. Existing windthrow in the Ten-mile drainage has been caused by severe northwesterly winds. The mouth of valley on Tenakee Inlet is exposed to southeasterly winds.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Cable system, individual tree, with partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: See Fisheries and Hydrology.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Shovel yarding, where feasible.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

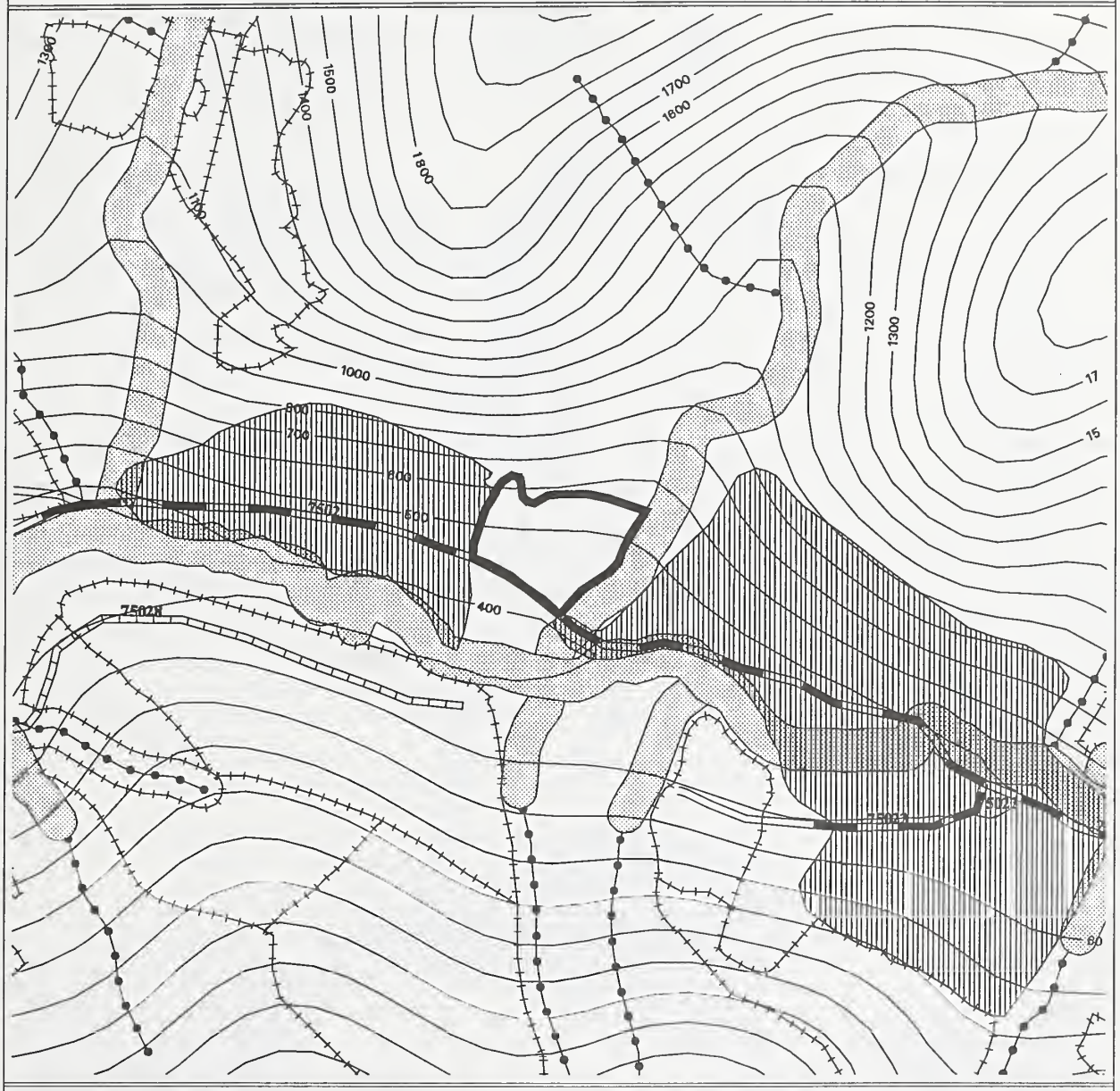
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20710 QUAD(s): SITD5NE

ACRES: 11 Unit 20710 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 20810 VCU: 2221
ACRES: 21.8 VOLUME (MBF): 351

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	246	Helicopter	Overstory Removal
C	70	246	Helicopter	Overstory Removal
D	70	246	Helicopter	Overstory Removal
E	80	281	Helicopter	Overstory Removal
F	80	281	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Windfirm boundary to Class II streams.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Overstory removal >18 inches dbh, helicopter yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm boundary along stream on west side.

{ TIMBER } FIELD REVIEW: J.STELICK APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

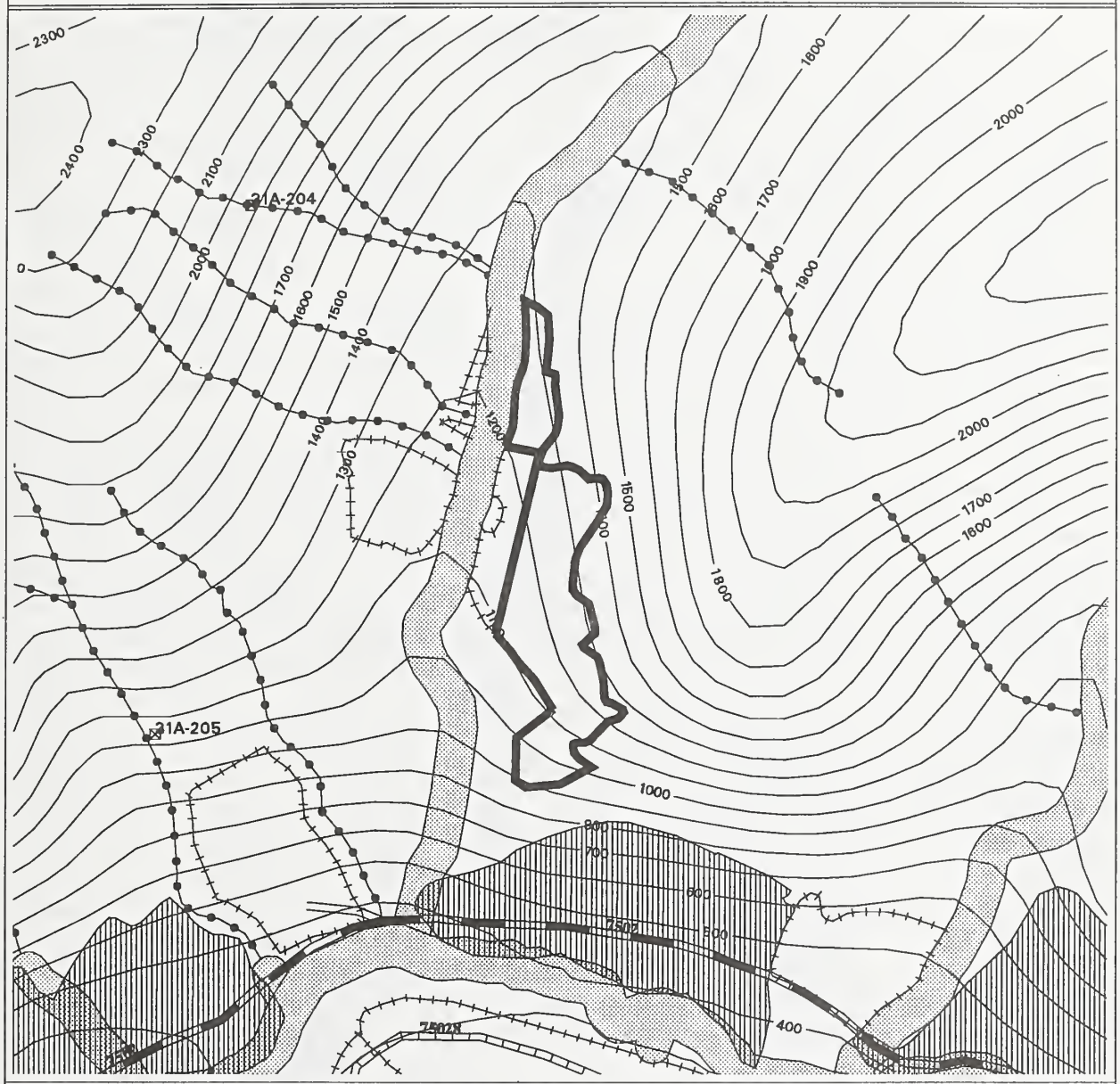
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20810 QUAD(s): SITD5NE

ACRES: 22 Unit 20810 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 20812 VCU: 2221
ACRES: 4.6 VOLUME (MBF): 84

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	70	59	Helicopter	Overstory Removal
D	70	59	Helicopter	Overstory Removal
F	80	67	Helicopter	Overstory Removal

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Windfirm boundary to Class II stream.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Overstory removal >18 inches dbh, helicopter yarding.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm boundary along stream on west side.

{ **TIMBER** } FIELD REVIEW: J.STELICK APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

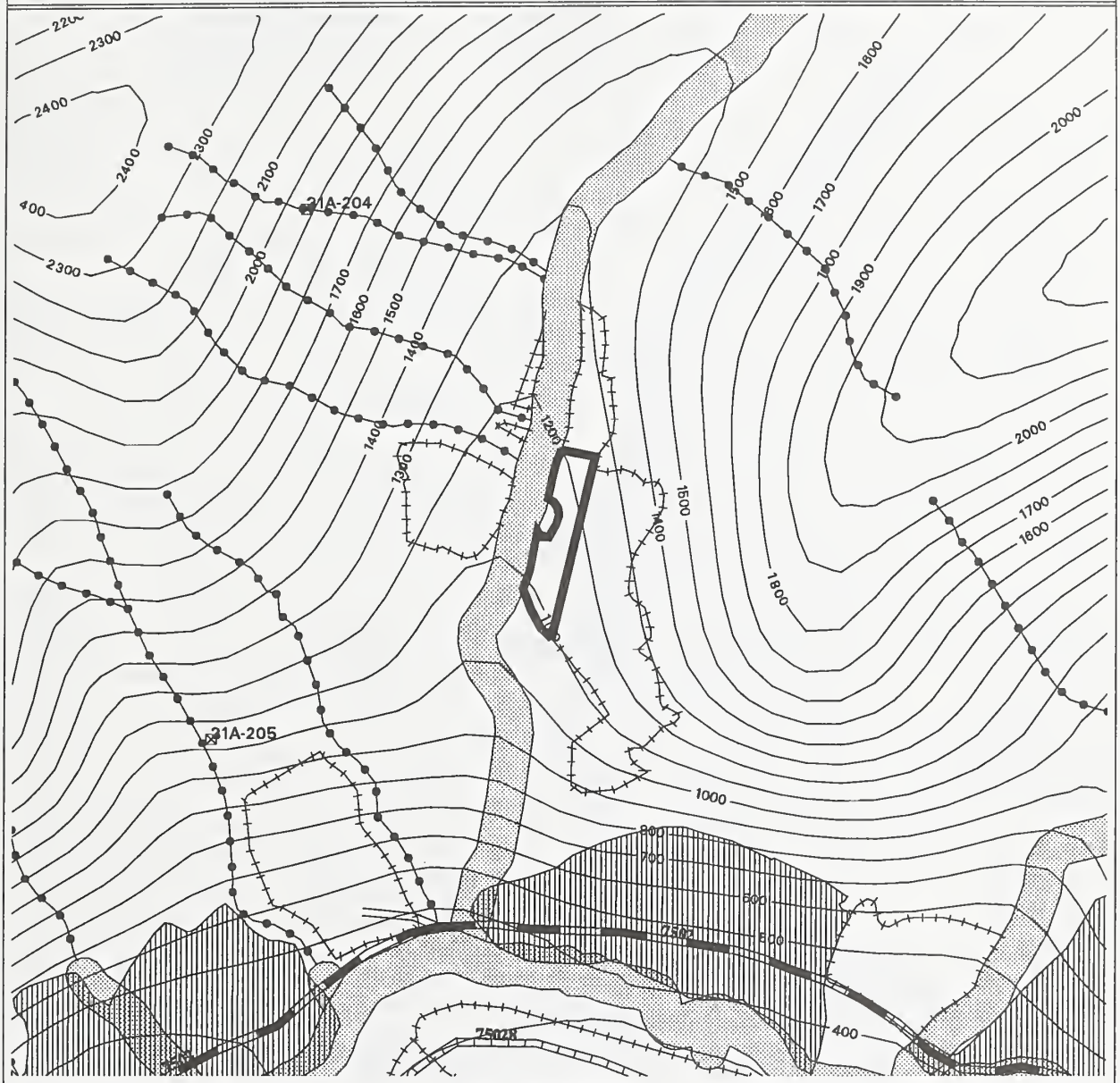
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20812 QUAD(s): SITD5NE

ACRES: 5 Unit 20812 Occurs in Alternatives: C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 20910 VCU: 2221
ACRES: 8.5 VOLUME (MBF): 112

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	50	56	Helicopter	Patch Clearcut
D	50	56	Helicopter	Patch Clearcut
E	80	90	Helicopter	Overstory Removal
F	80	90	Helicopter	Overstory Removal

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. Low survey priority.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16. Windfirm boundary to east side Class II stream.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along stream on east side of unit.

{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

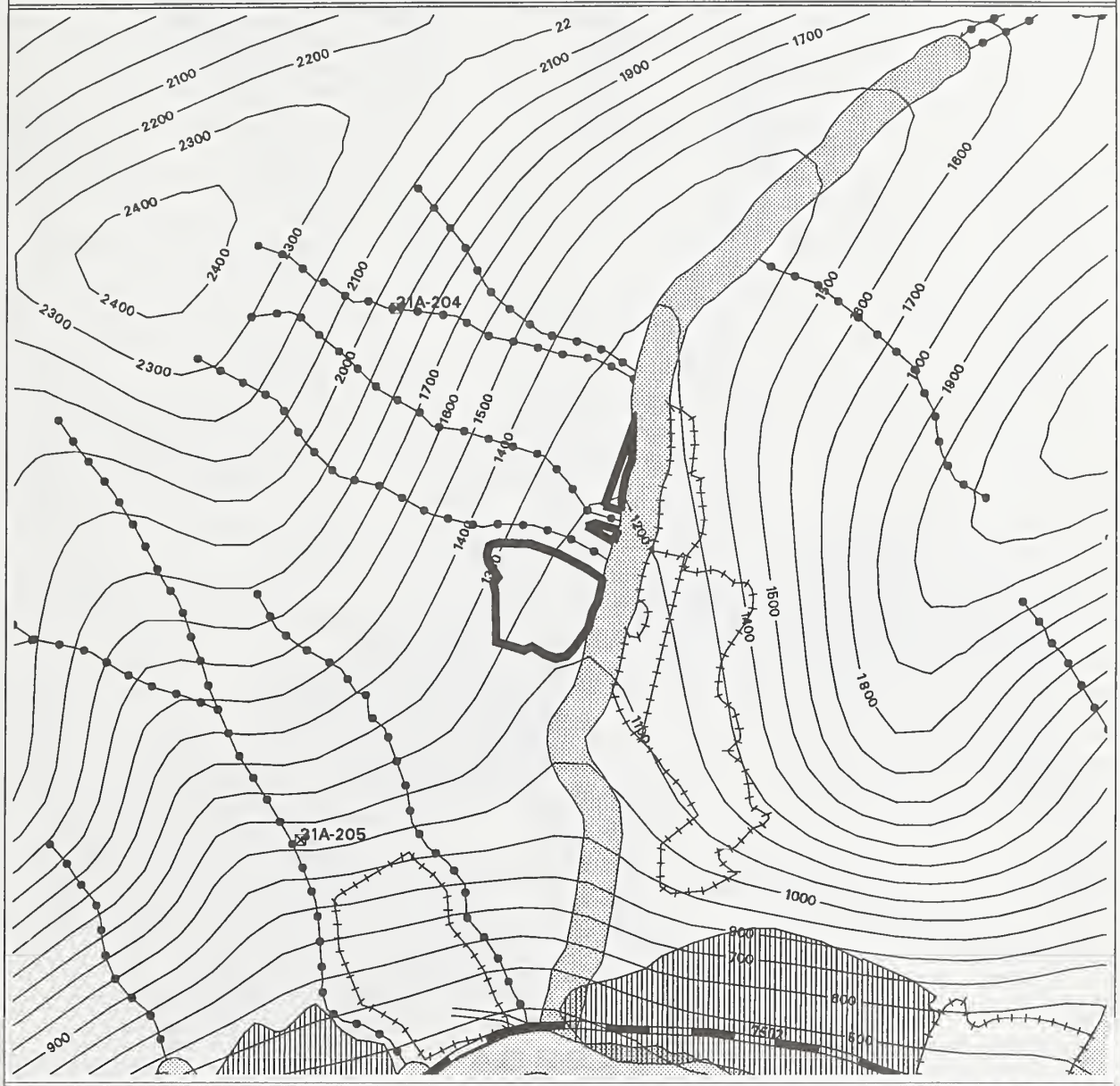
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C.(Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 20910 QUAD(s): SITD5NE

ACRES: 8 Unit 20910 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 21010 VCU: 2221
ACRES: 16.1 VOLUME (MBF): 466

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	233	Cable	Single Tree Selection
C	90/95	213/218	Cable	Clearcut w/ retention
D	90/95	213/218	Cable	Clearcut w/ retention
E	50	233	Cable	Single Tree Selection
F	50	233	Cable	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors. Cable yarding.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in lower SW boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. (AF2 channel). Upstream, the HC6 channel is Class III, category B, as is the HC6 channel on the E boundary. Protect as per BMP 13.16 (and 13.3). Existing blowdown and unstable banks along the west boundary HC6/AF2 channel is a concern. Leave windfirm boundary along both W and E boundaries.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns. Alts C and D, plant spruce on lower flat portions.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: See Fisheries.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

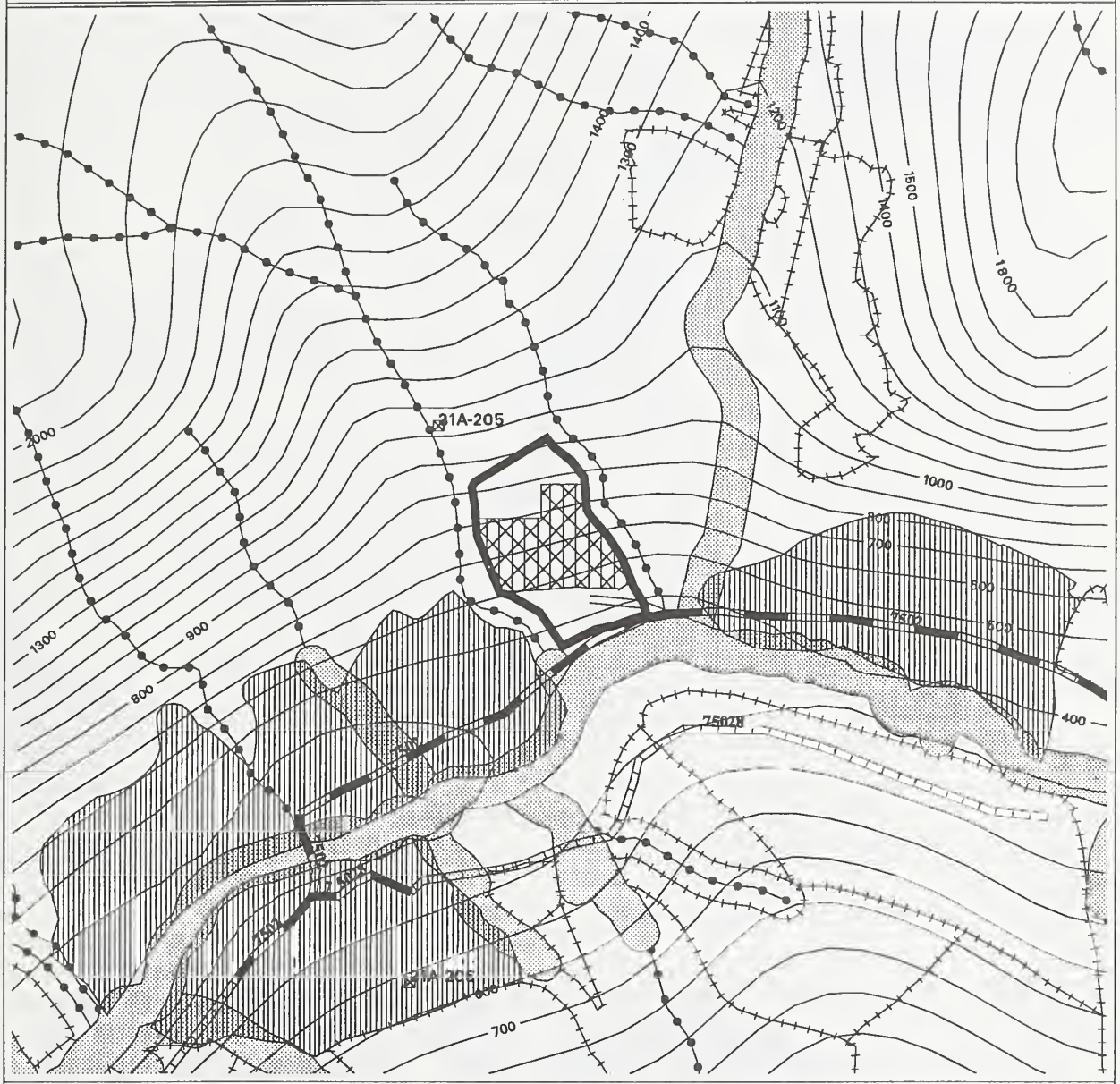
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Red-tailed hawk seen in unit. Survey as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21010 QUAD(s): SITD5NE

ACRES: 16 Unit 21010 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 21310 VCU: 2221
ACRES: 1.3 VOLUME (MBF): 38

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	19	Helicopter	Overstory Removal
F	35	13	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Deeply incised main LC2 channel is Class I. Maintain buffers on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Deeply incised HC6 channel on N boundary and smaller channel on S boundary are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Old blowdown present along HC6 channel. Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Windfirm boundary to Class III streams. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal > 18 inches dbh.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on north and south sides of unit.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Recommend clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

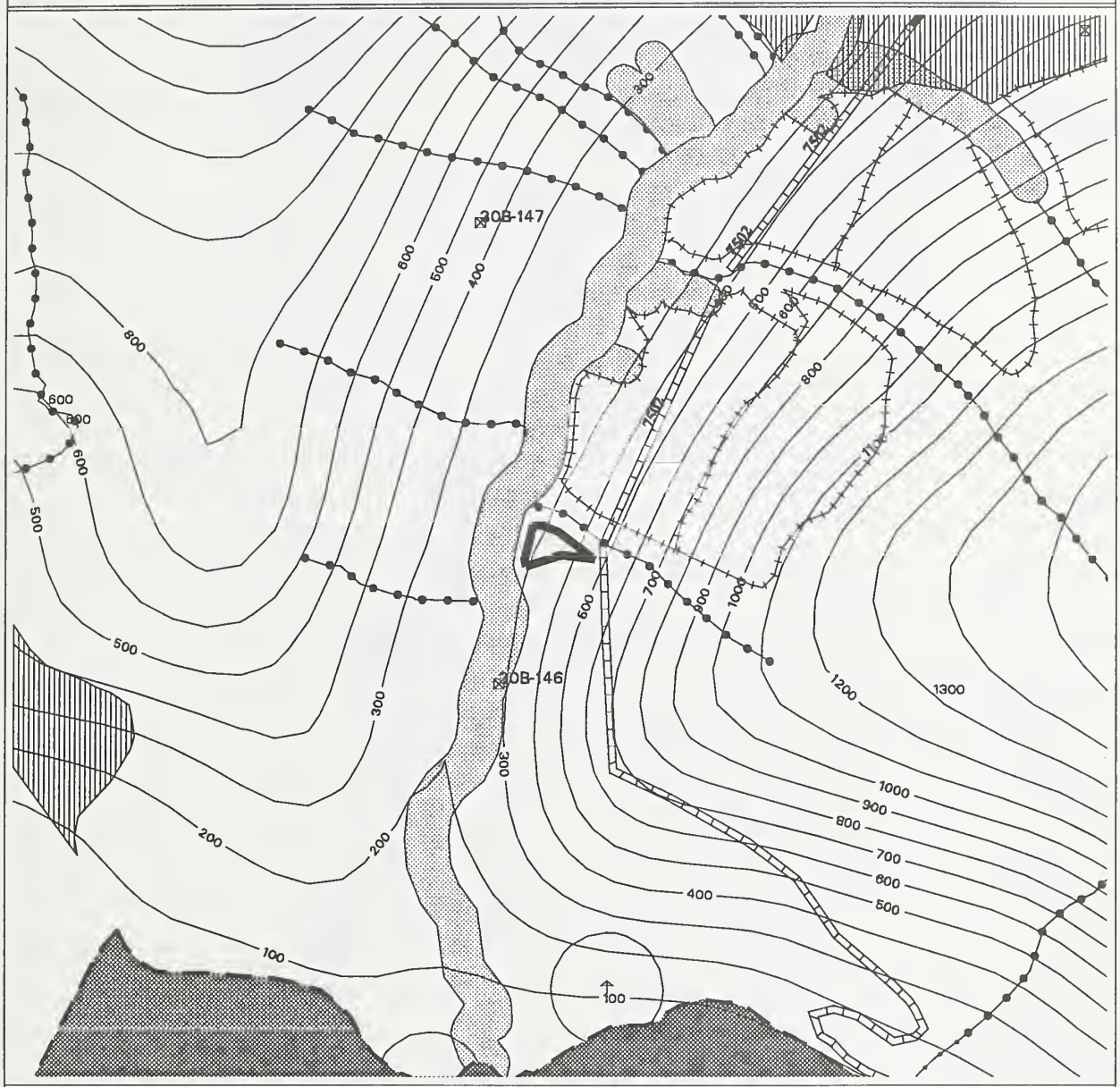
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: Recommend group selection to maintain visual objectives from Tenakee Inlet. LA to assist in unit layout.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Wildlife biologist on site during layout to identify bear buffer. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21310 QUAD(s): SITD5NE

ACRES: 1 Unit 21310 Occurs in Alternatives: B F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/99

INDIAN RIVER UNIT CARD

UNIT: 21410 VCU: 2221
ACRES: 25.1 VOLUME (MBF): 727

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	145	Cable	Patch Clearcut
C	35	254	Helicopter	Patch Clearcut
D	35	254	Helicopter	Patch Clearcut
F	35	254	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: The lower end of NE boundary stream is Class II. Main channel MM2/LC2 stream is Class I. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams near lower NW boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Deeply incised HC6 channels on SW and NE boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial suspension. Leave windfirm boundary on south side. (See Fisheries)

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

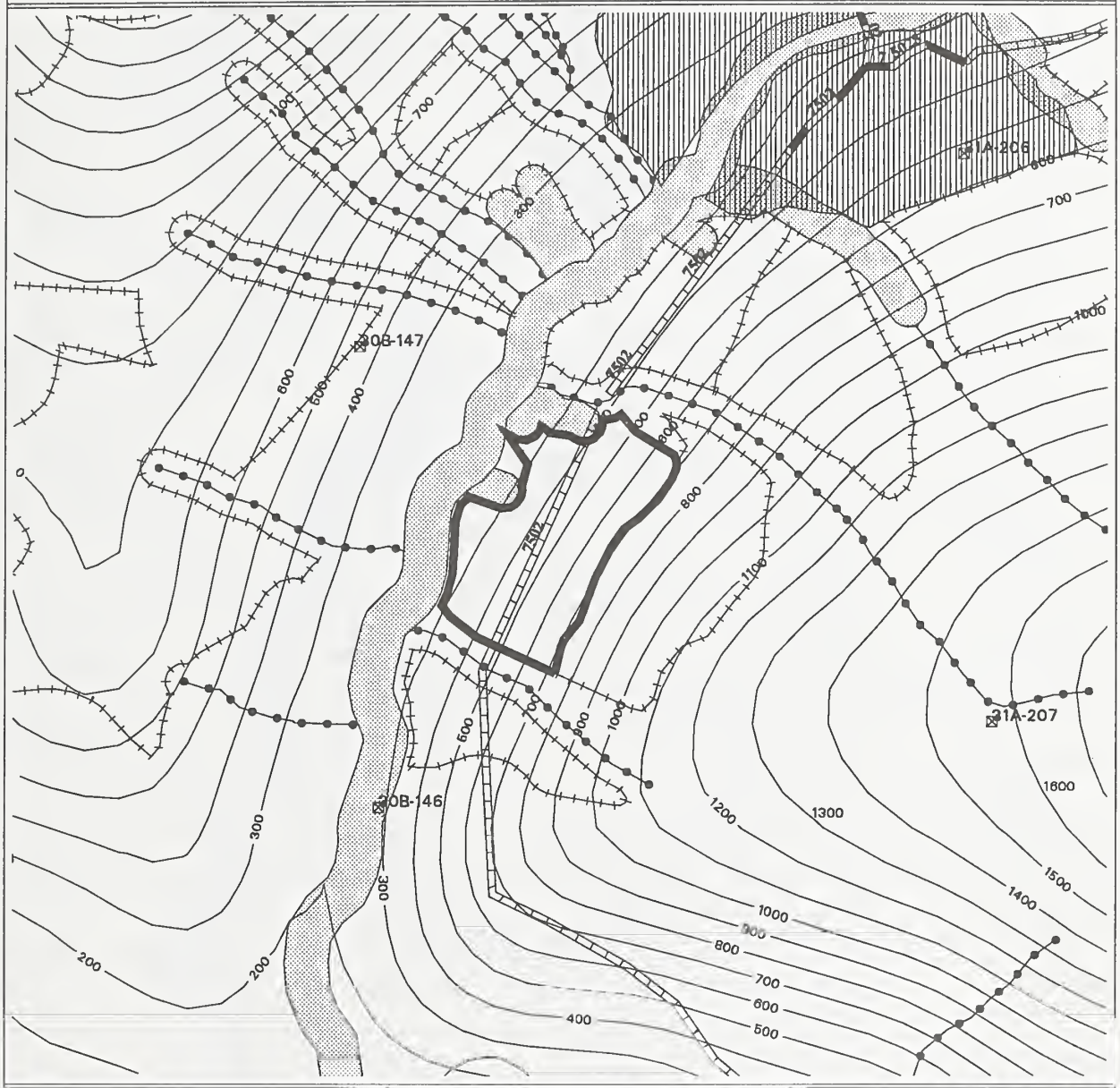
{ VISUAL } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: Recommend group selections in southern half of unit to meet visual objectives. LA to assist in unit layout.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Group selections will help maintain suitable travel corridor. Wildlife biologist on site during layout to identify bear buffer. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21410 QUAD(s): SITD5NE

ACRES: 25 Unit 21410 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 21420 VCU: 2221
ACRES: 25.0 VOLUME (MBF): 723

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	145	Helicopter	Group Selection
C	35	253	Helicopter	Patch Clearcut
D	35	253	Helicopter	Patch Clearcut
F	35	253	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Protect identified Class III, category B, HC6 streams on NE and SW boundaries as per BMP 13.16 (and 13.3). Leave windfirm boundary . Also see soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend group selection or overstory removal.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

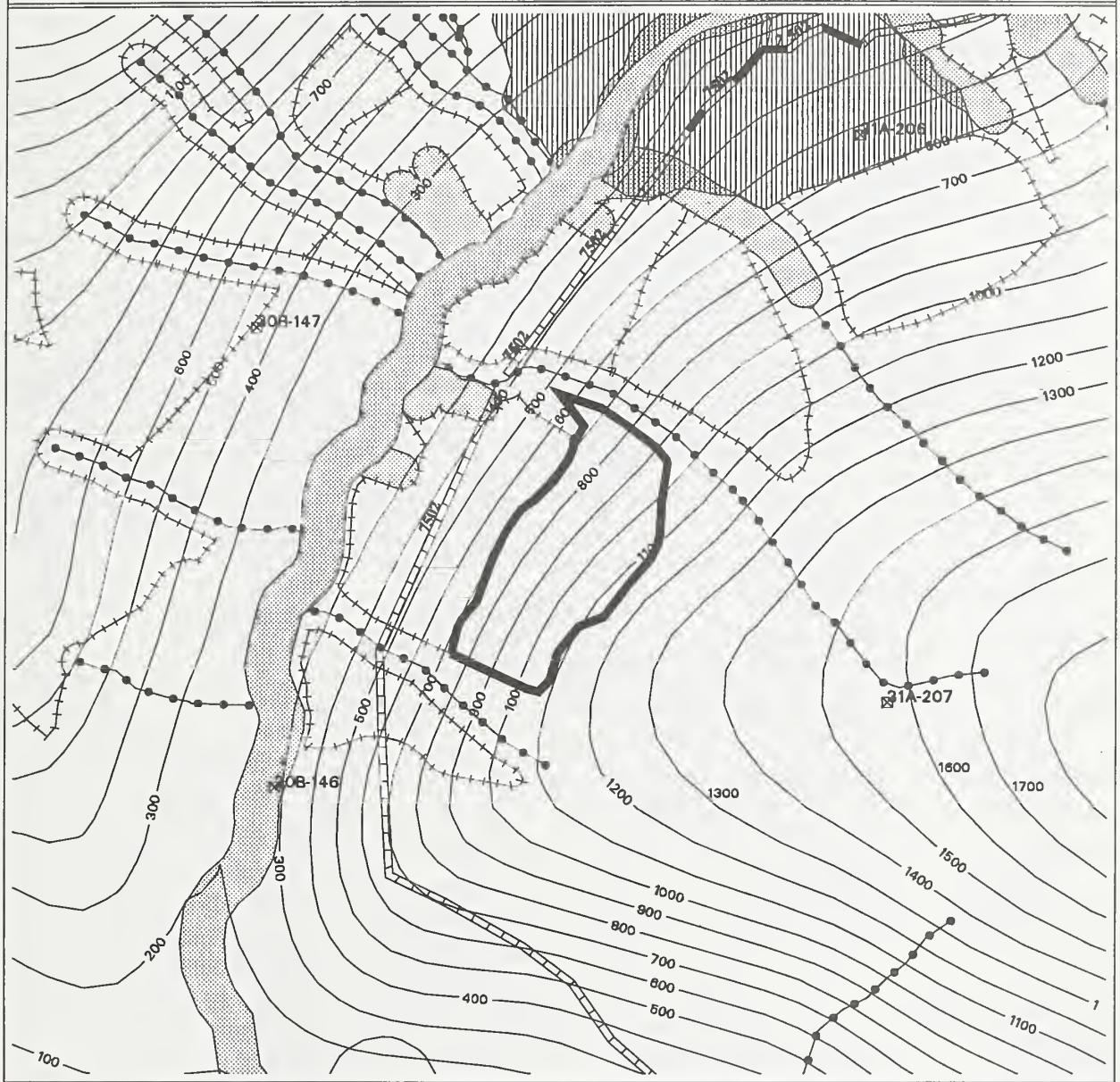
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: Group selection on southern half of unit to maintain visual objectives.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21420 QUAD(s): SITD5NE

ACRES: 25 Unit 21420 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 21511 VCU: 2221
ACRES: 17.6 VOLUME (MBF): 509

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	102	Cable	Patch Clearcut
C	95	483	Cable	Clearcut w/ retention
D	95	483	Cable	Clearcut w/ retention
F	95	483	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including valley bottom MM2 (Class I) and smaller Class I/II streams along lower boundary about up to road. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Deeply incised HC2 and HC6 channels on NE and SW boundaries are Class III upstream of the road. Protect these category B streams as per BMP 13.16 (and 13.3). Leave windfirm boundary on these channels and lower MM2 stream. Feather (remove larger trees, retain nonmerchantable trees) edges adjacent to stream buffers to increase probability that they will remain windfirm, along MM2 buffer and lower, Class II buffers. Place unit boundary at or above slope break of Class III channels (2/3 rule) on SW HC6 channel. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to stream channels. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention on part of unit that can be cable yarded.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on southwest side of unit. (See Fisheries)

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

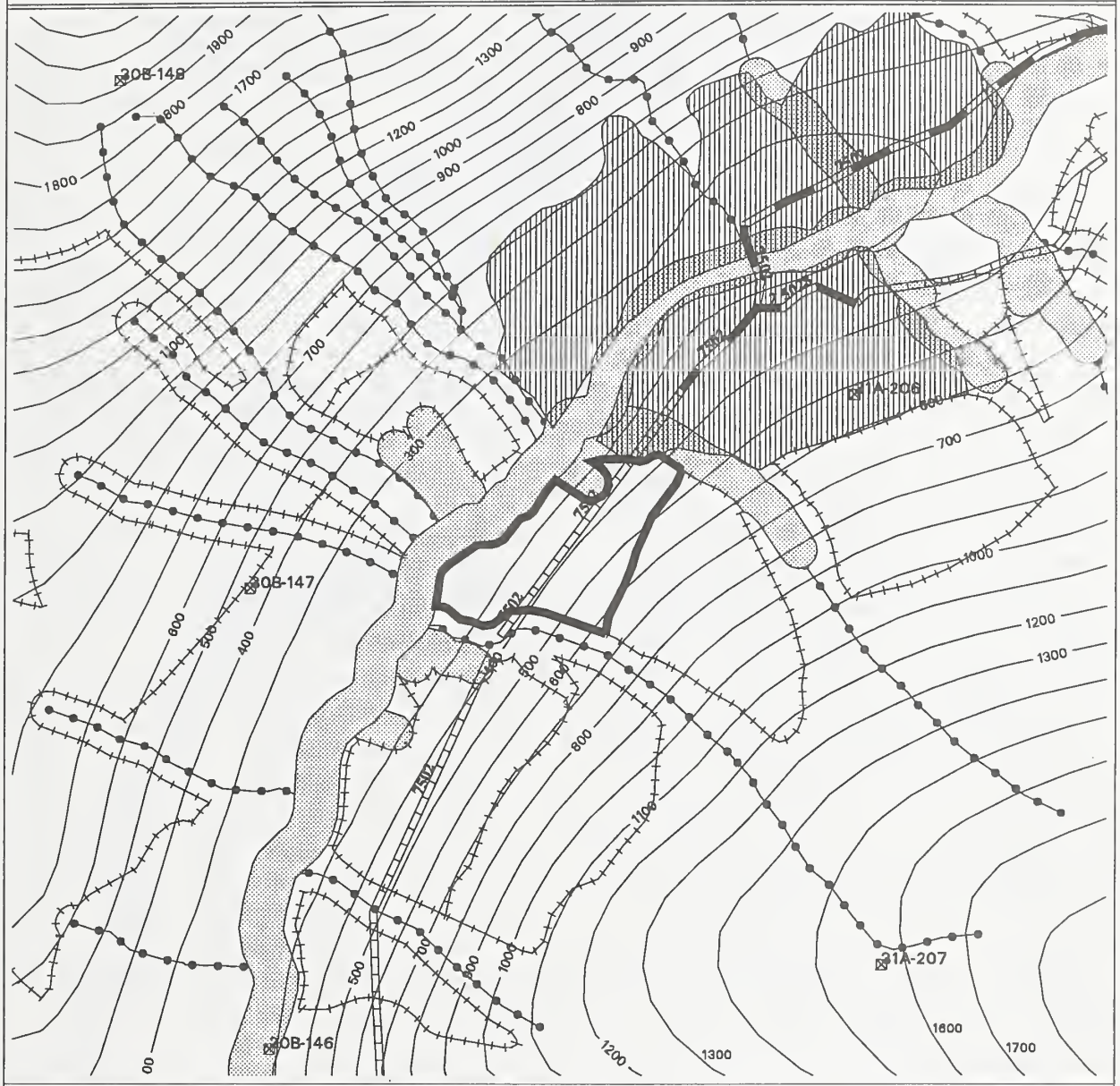
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Wildlife biologist on site during layout to identify bear buffer. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21511 QUAD(s): SITD5NE

ACRES: 18 Unit 21511 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 21520 VCU: 2221
ACRES: 23.5 VOLUME (MBF): 679

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	340	Helicopter	Overstory Removal
C	95	645	Helicopter	Clearcut w/ retention
D	95	645	Helicopter	Clearcut w/ retention
F	95	645	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Protect Class III, category B HC2 and HC6 streams on NE and SW boundaries and a small v-notch stream in the NE quadrant per BMP 13.16 (and 13.3). Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer on NE HC2 channel to increase probability of remaining windfirm. Also, see hydrology and soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to stream channels. BMP 12.6a; 13.16.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Blowdown. Recommend clearcut with retention or overstory removal >16 inches dbh for 60% - 70% of volume.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on Class III channel on southwest corner of unit.

{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

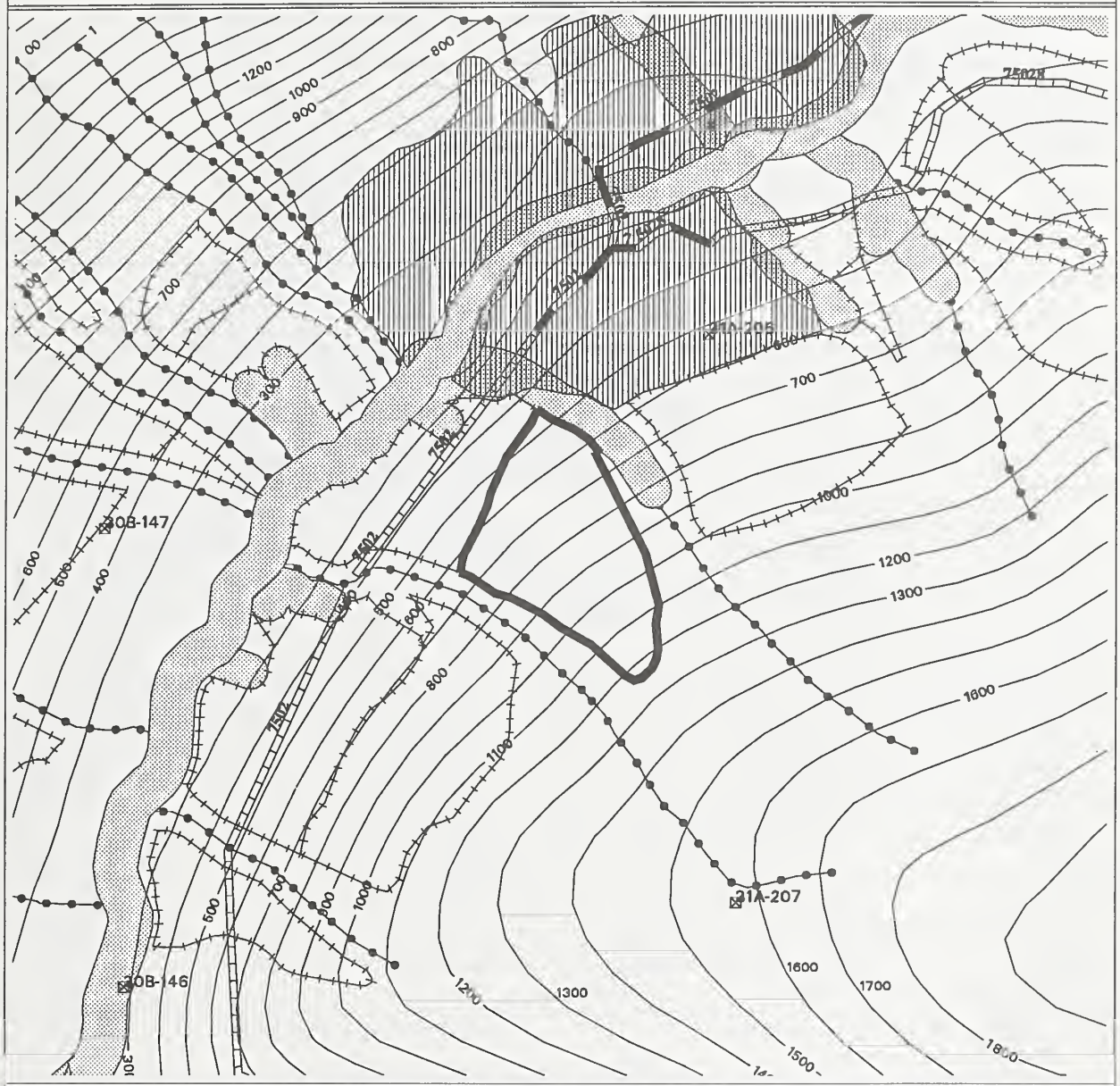
{ **VISUAL** } FIELD REVIEW: B.HAMBERG APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21520 QUAD(s): SITD5NE

ACRES: 23 Unit 21520 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/2001

INDIAN RIVER UNIT CARD

UNIT: 21610 VCU: 2221
ACRES: 12.3 VOLUME (MBF): 336

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	40	136	Helicopter	Single Tree Selection
C	40	136	Helicopter	Single Tree Selection
D	40	136	Helicopter	Single Tree Selection
E	20	67	Helicopter	Single Tree Selection
F	40	136	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of category A fish streams (Class II) along W and NE boundaries of both blocks. These include HC2 channel on W boundary and two FSO channels on either side of the smaller NE block. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Incised HC6 channel on W boundary and smaller channels between blocks and on E side of smaller block are category B streams, where they become Class III upstream of Class II habitat. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Single Tree Selection for 40% or less of volume due to windthrow concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

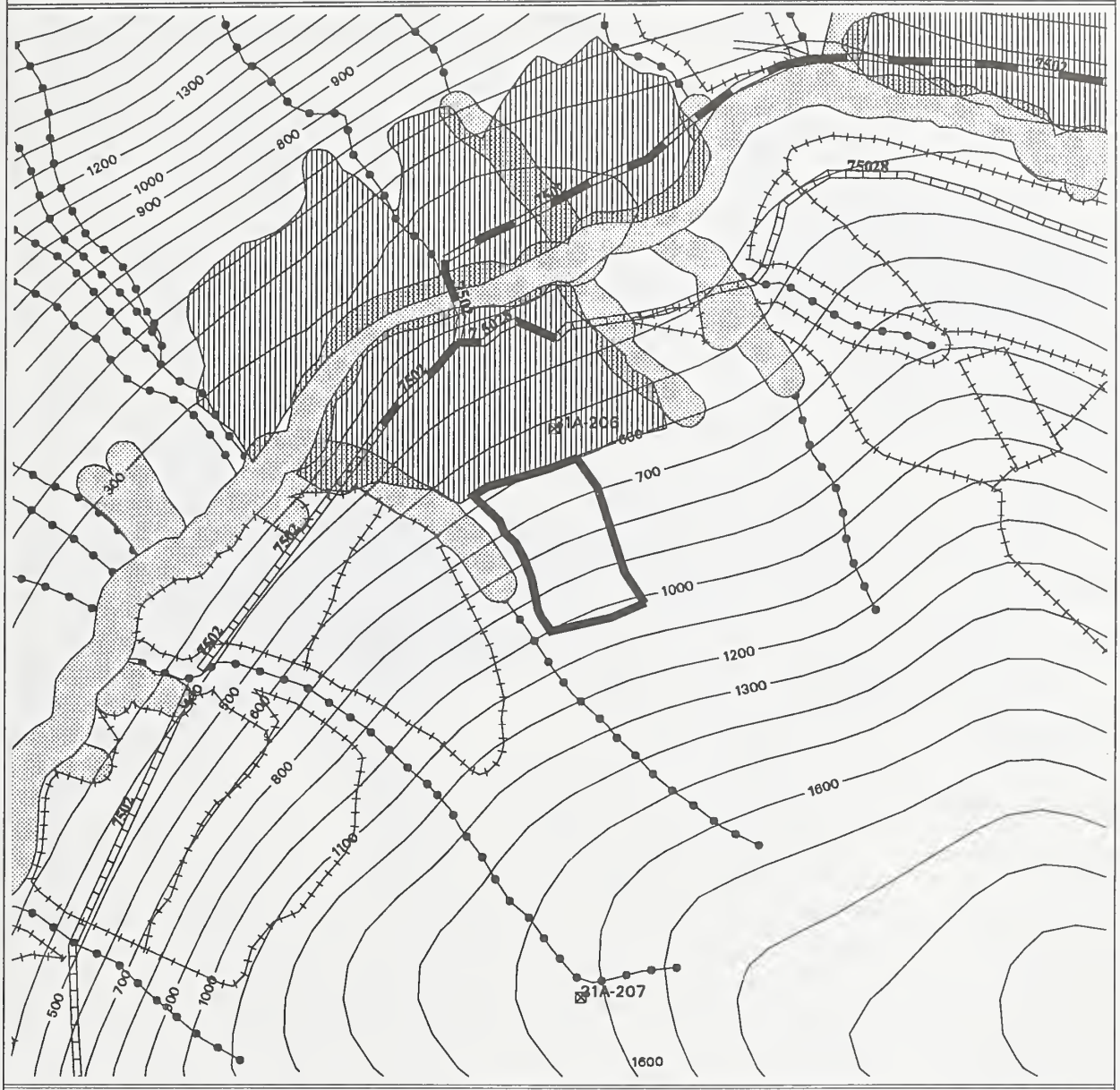
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21610 QUAD(s): SITD5NE

ACRES: 12 Unit 21610 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 21711 VCU: 2221
ACRES: 1.0 VOLUME (MBF): 18

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
E	95	17	Cable	Clearcut w/ retention

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: FSO channels on E and W boundaries are Class II. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to both stream buffers to increase probability that they will remain windfirm.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Cable system, clearcut, partial suspension.
{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21711 QUAD(s): SITD5NE

ACRES: 1 Unit 21711 Occurs in Alternatives: E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 21811 VCU: 2221
ACRES: 8.5 VOLUME (MBF): 142

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	28	Helicopter	Group Selection
E	95	135	Cable	Clearcut w/ retention
F	95	135	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower NW boundary and lower end of HC6 channel on SW boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. If harvest is >60%, leave windfirm boundary. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm, along MM2 Class I buffer and Class II buffer in SW corner. Class III section of HC6 channel on S boundary is category B stream. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream for Alternatives E and F. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention due to blowdown concerns; partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21811 QUAD(s): SITD5NE

ACRES: 9 Unit 21811 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 21820 VCU: 2221
ACRES: 51.9 VOLUME (MBF): 1028

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	206	Helicopter	Group Selection
C	95	976	Cable	Clearcut w/ retention
D	95	976	Cable	Clearcut w/ retention
E	95	976	Cable	Clearcut w/ retention
F	95	976	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including MM2 channel along lower N boundary and the Class II AF2 stream on E boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut with retention due to concerns with blowdown; partial suspension.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

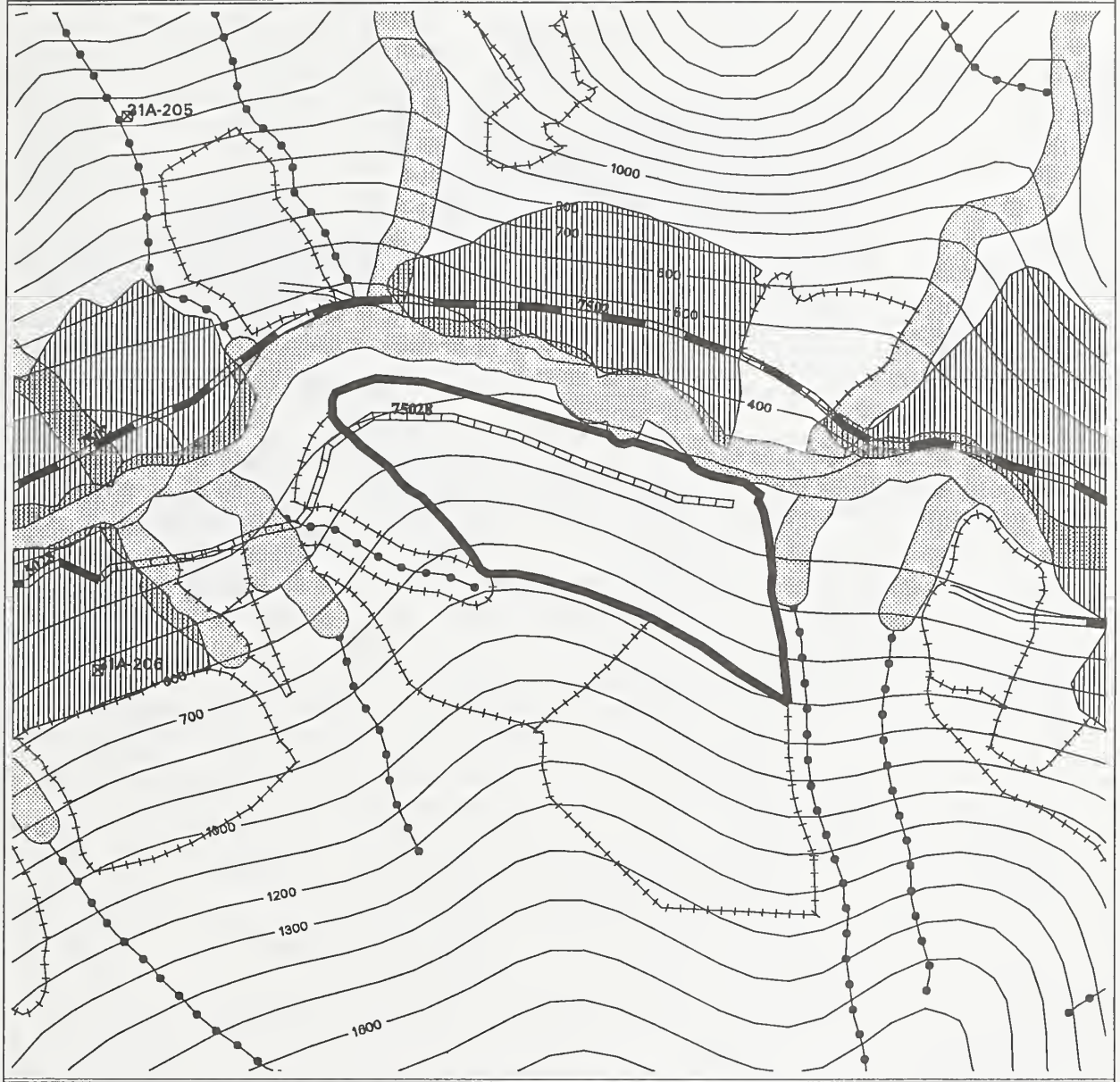
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers/unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21820 QUAD(s): SITD5NE

ACRES: 52 Unit 21820 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 21830 VCU: 2221
ACRES: 18.7 VOLUME (MBF): 438

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	416	Helicopter	Clearcut w/ retention

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams in lower NW corner, where HC6 channels become Class II HC2 streams. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. HC6 channels on NW and W boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary .
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Clearcut, helicopter harvest.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: L.WINN, S.GODFREY APPROVED BY: M.REGAN REMARKS: Helicopter harvest.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21830 QUAD(s): SITD5NE

ACRES: 19 Unit 21830 Occurs in Alternatives: B


1000
800
700
500
600
400
7502
7502B
7502
7502
7502

INDIAN RIVER UNIT CARD

UNIT: 21840 VCU: 2221
ACRES: 43.0 VOLUME (MBF): 1157

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	1048	Helicopter	Clearcut w/ retention
C	95	1048	Helicopter	Clearcut w/ retention
D	95	1048	Helicopter	Clearcut w/ retention
E	95	1048	Helicopter	Clearcut w/ retention
F	95	1048	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream. BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Clearcut, helicopter harvest.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

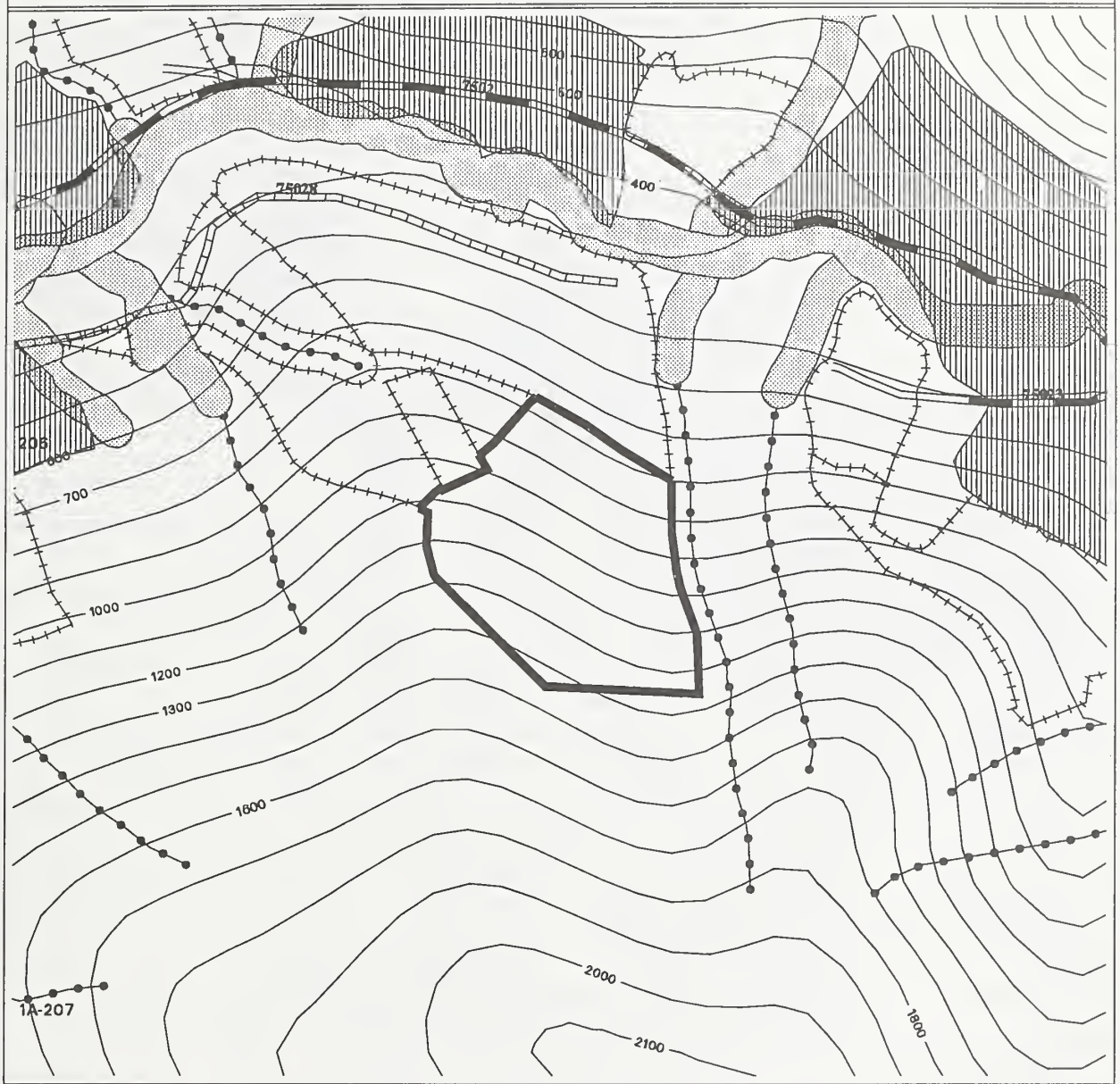
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21840 QUAD(s): SITD5NE

ACRES: 43 Unit 21840 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/94

INDIAN RIVER UNIT CARD

UNIT: 21910 VCU: 2221
ACRES: 11.7 VOLUME (MBF): 211

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	105	Helicopter	Overstory Removal
C	95	201	Helicopter	Clearcut w/ retention
D	95	201	Helicopter	Clearcut w/ retention
E	95	201	Helicopter	Clearcut w/ retention
F	95	201	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including Class I, MM2 channel along lower N boundary and Class I/II, AF2 channel along lower W boundary. Maintain buffer on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability of remaining windfirm. HC6 channel upstream of AF2 is Class III, category B. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend helicopter yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial suspension. Windfirm boundary on west side.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

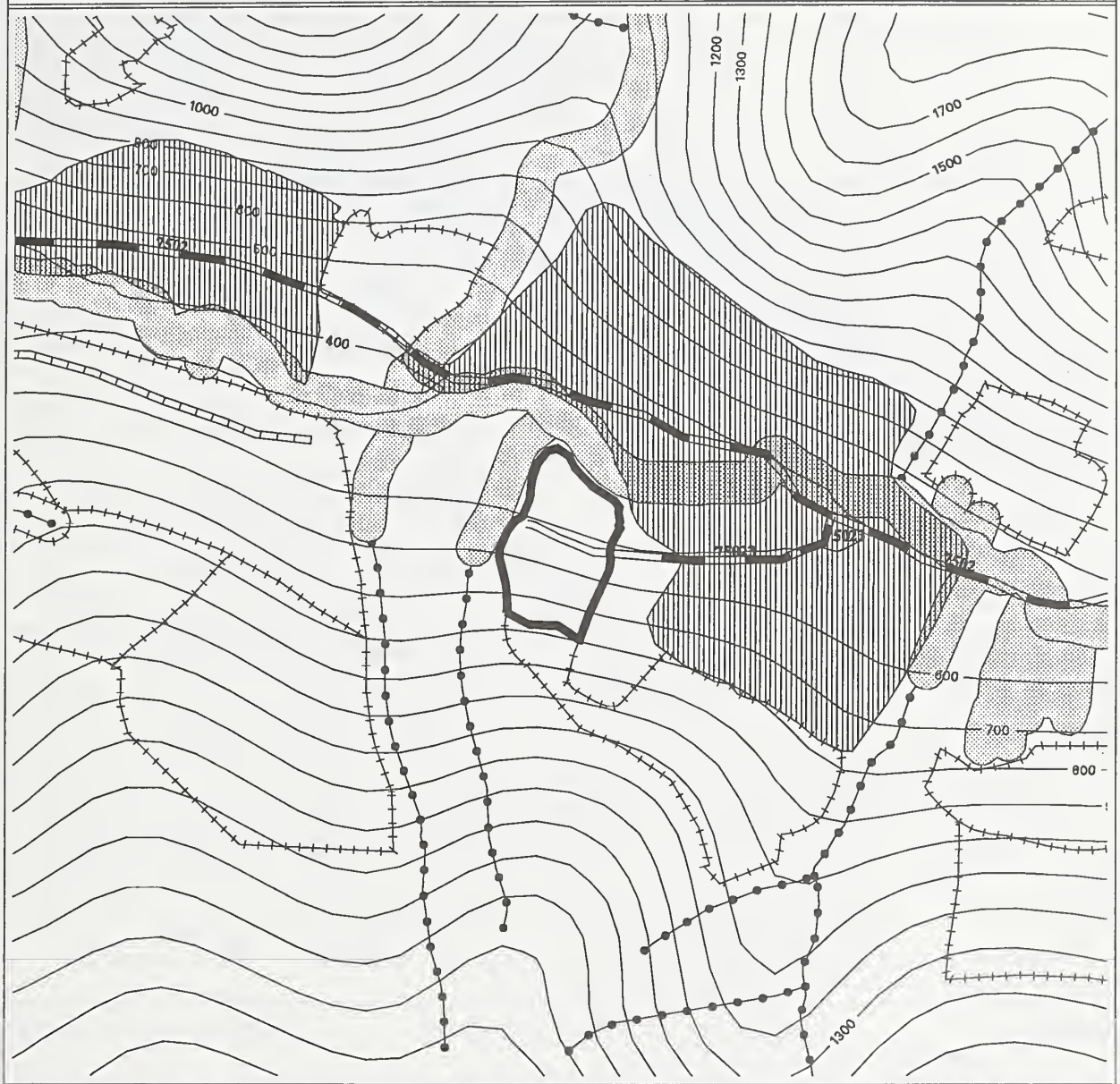
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 21910 QUAD(s): SITD5NE

ACRES: 12 Unit 21910 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 22010 VCU: 2221
ACRES: 26.0 VOLUME (MBF): 458

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	229	Helicopter	Overstory Removal
C	50	229	Helicopter	Overstory Removal
D	50	229	Helicopter	Overstory Removal
E	80	367	Helicopter	Overstory Removal
F	80	367	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Helicopter yarding. In general, retain trees throughout unit in order to maintain root strength. However, concentrate leave trees in steepest areas.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Partial harvest to retain some root strength. Leave windfirm boundary along southeast side of unit.

{ TIMBER } FIELD REVIEW: L.WINN, S.GODFREY APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

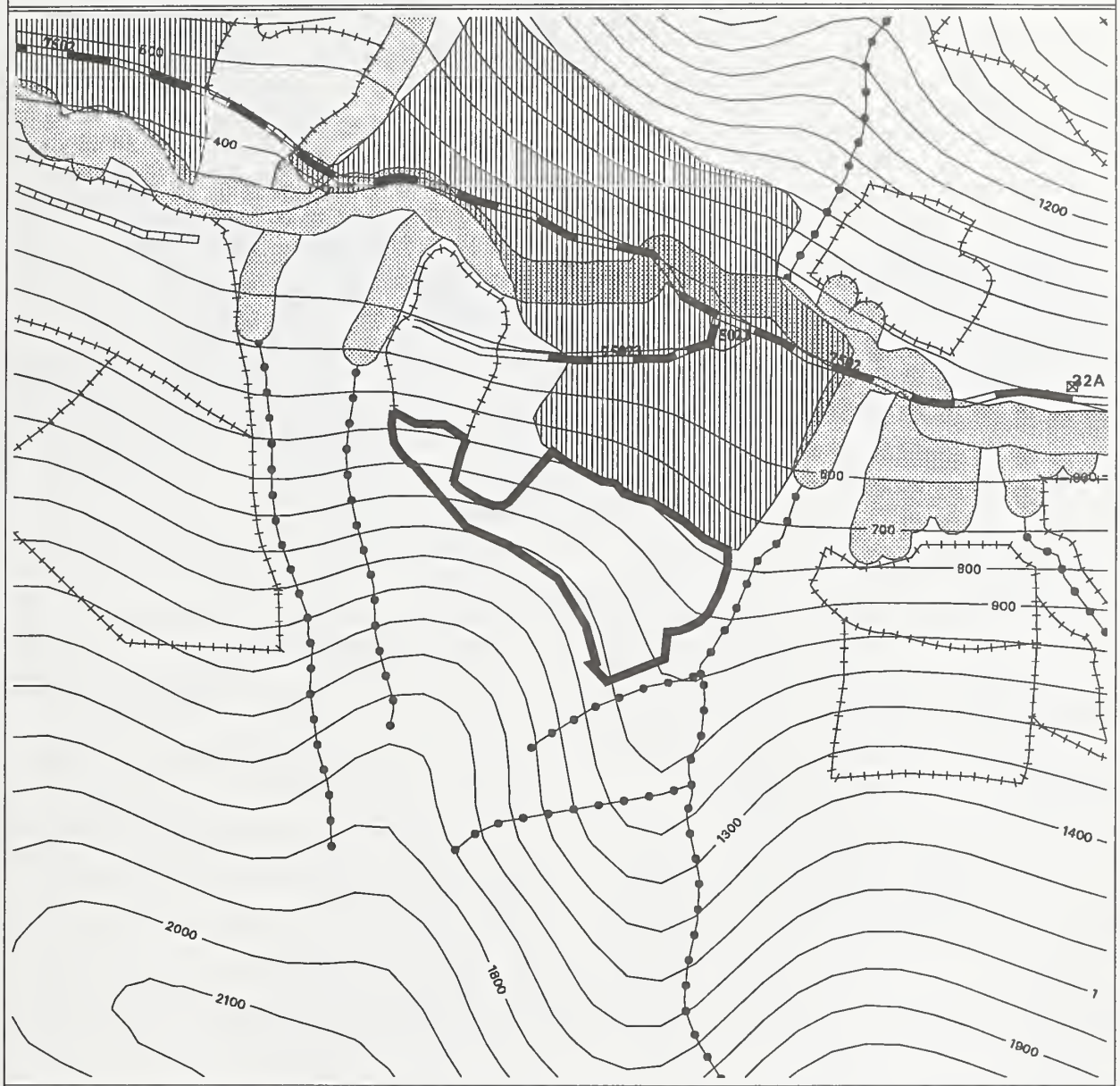
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22010 QUAD(s): SITD5NE

ACRES: 26 Unit 22010 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 6/6/2018

INDIAN RIVER UNIT CARD

UNIT: 22110 VCU: 2221
ACRES: 14.2 VOLUME (MBF): 259

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	50	129	Helicopter	Overstory Removal
C	40	103	Helicopter	Single Tree Selection
D	40	103	Helicopter	Single Tree Selection
E	40	103	Helicopter	Single Tree Selection
F	40	103	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams. This includes at least 6 streams along the lower N boundary that become Class III or IV upstream within the unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Protect multiple Class III, category B and C streams in the unit and along E boundary (BMP 13.16 and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Split-yard v-notch or full suspension for these streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Recommend overstory removal >20 inches dbh with directional falling due to highly dissected ground and stand defect.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: In general, retain trees throughout unit in order to maintain root strength. However, concentrate leave trees in steepest areas.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

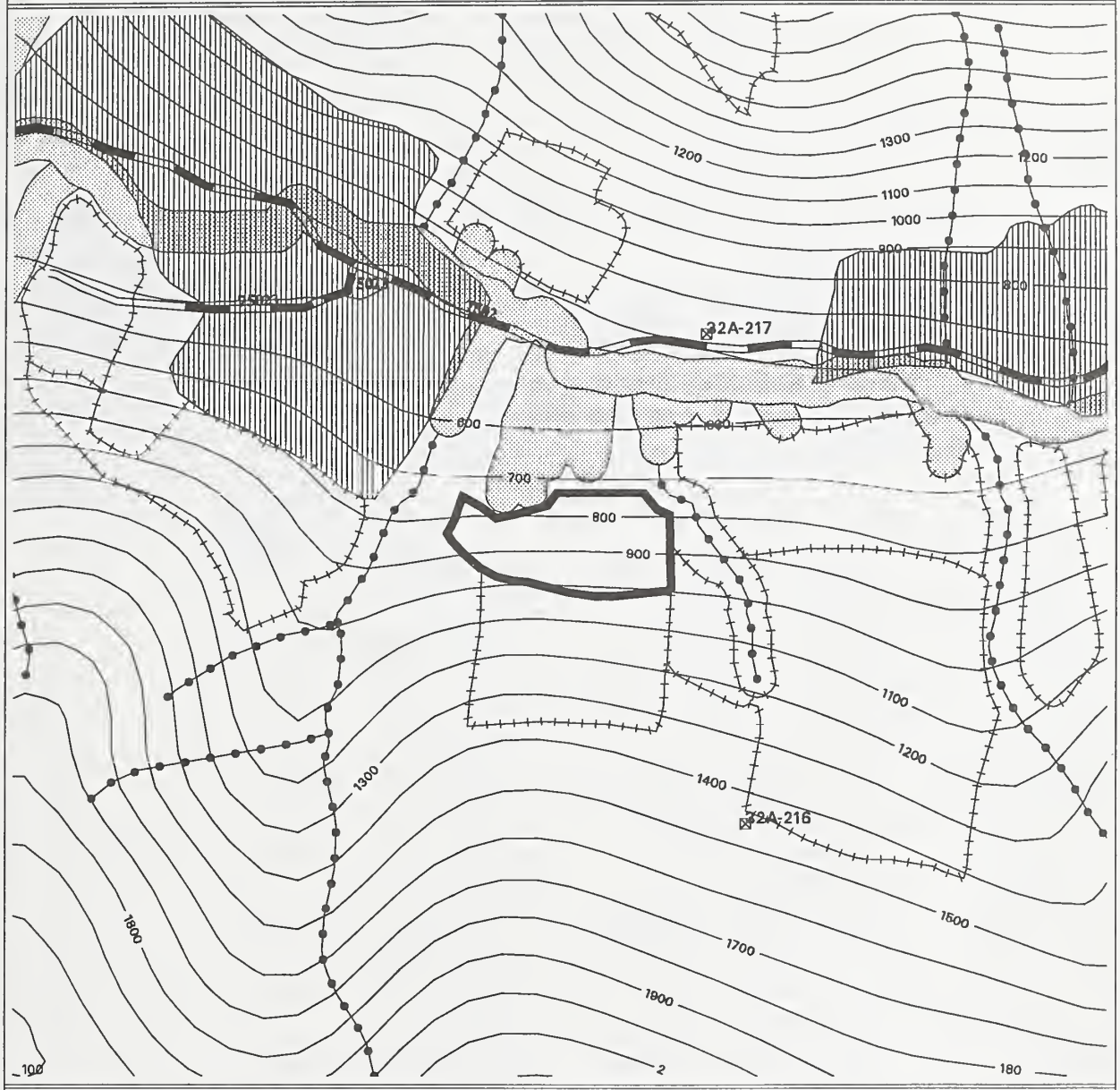
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22110 QUAD(s): SITD5NE

ACRES: 14 Unit 22110 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 22120 VCU: 2221
ACRES: 26.4 VOLUME (MBF): 543

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	40	217	Helicopter	Single Tree Selection
D	40	217	Helicopter	Single Tree Selection
E	40	217	Helicopter	Single Tree Selection
F	40	217	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams. This includes main channel, Class I MM2 along lower N boundary, 3 smaller Class I/II FSO streams along lower boundary, and lower ends of HC6 channels on E and W boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Protect the Class III and IV, category B and C streams within the unit (upstream ends of smaller Class II at lower unit boundary), and the category B, channels along E and W boundaries as per BMP 13.16 (and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Split-yard v-notch or full suspension for these streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Helicopter harvest, individual tree selection.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Helicopter harvest. In general, retain trees throughout unit in order to maintain root strength. However, concentrate leave trees in steepest areas.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22120 QUAD(s): SITD5NE

ACRES: 26 Unit 22120 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/2009

INDIAN RIVER UNIT CARD

UNIT: 22130 VCU: 2221
ACRES: 20.5 VOLUME (MBF): 374

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	356	Helicopter	Clearcut w/ retention
C	95	356	Helicopter	Clearcut w/ retention
D	95	356	Helicopter	Clearcut w/ retention
E	95	356	Helicopter	Clearcut w/ retention
F	95	356	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Protect category B and C streams as per BMP 13.16 (and 13.3).

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Helicopter yarding.

{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

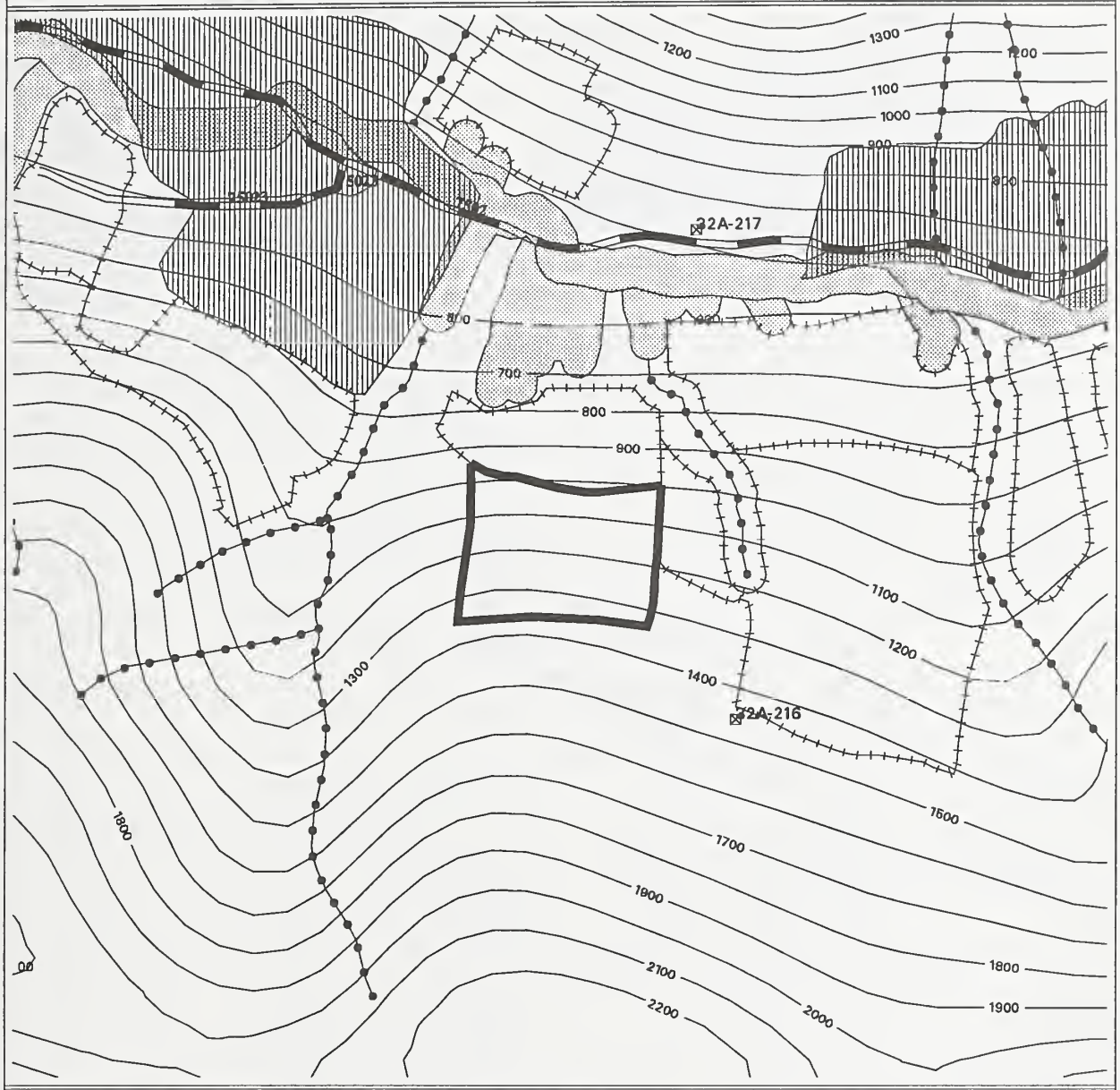
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22130 QUAD(s): SITD5NE

ACRES: 20 Unit 22130 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 22140 VCU: 2221
ACRES: 57.5 VOLUME (MBF): 1049

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	996	Helicopter	Clearcut w/ retention
C	40	420	Helicopter	Single Tree Selection
D	40	420	Helicopter	Single Tree Selection
E	40	420	Helicopter	Single Tree Selection
F	40	420	Helicopter	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Protect large, deeply incised category B Class III, HC6 channels on SE boundary and within NW corner as per BMP 13.16 (and 13.3). Leave windfirm boundary . Also, protect smaller Class III and IV, category B and C streams within unit as per BMP 13.16 (and 13.3). These v-notch channels in this heavily dissected ground have unstable banks. Directional fall v-notch for these streams.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class III streams for Alternative B. (BMP 13.16). Heavily v-notched.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Helicopter harvest, individual tree selection.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: In general, retain trees throughout unit in order to maintain root strength. However, concentrate leave trees in steepest areas.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

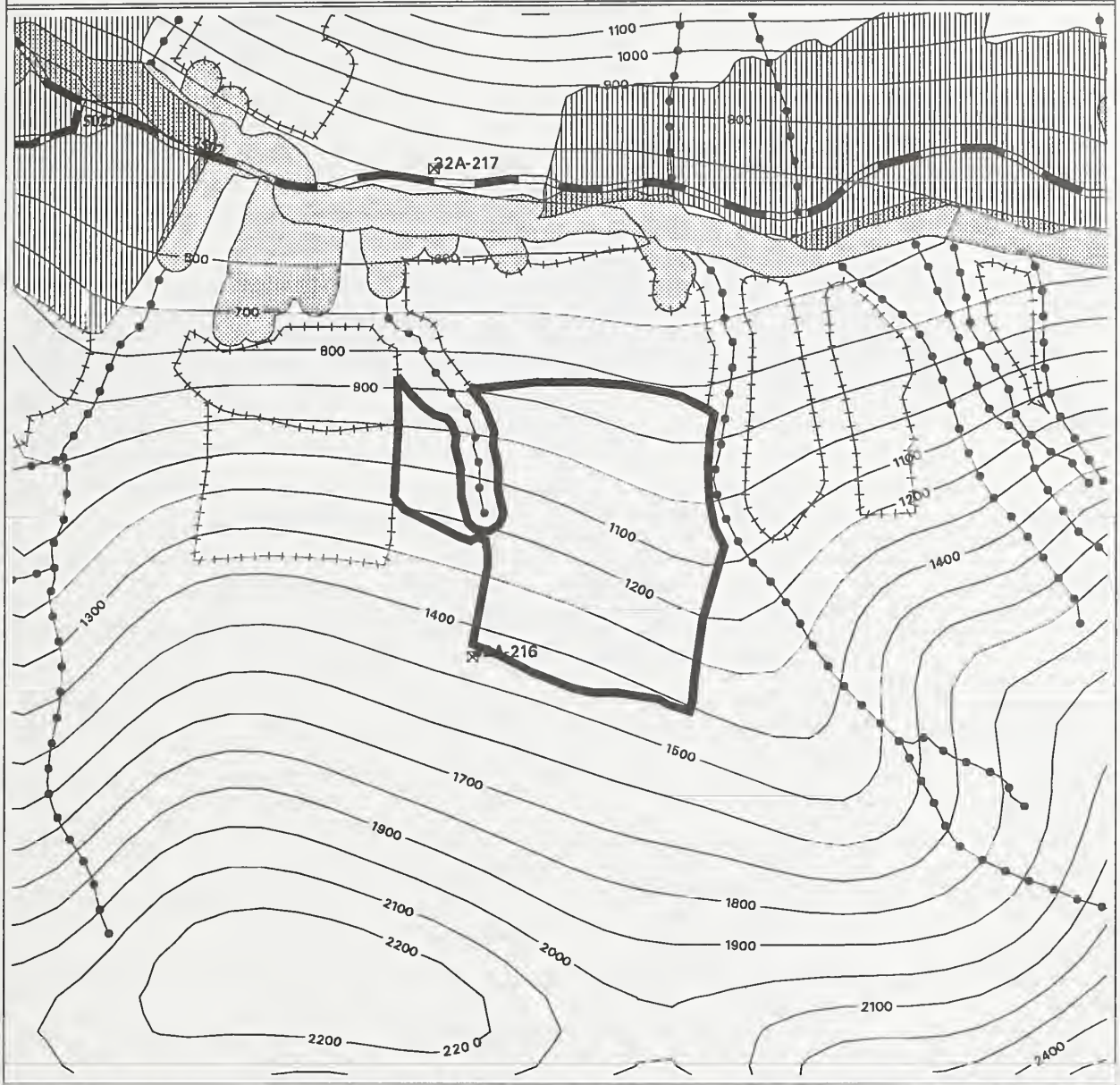
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22140 QUAD(s): SITD5NE

ACRES: 57 Unit 22140 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 22210 VCU: 2221
ACRES: 22.1 VOLUME (MBF): 438

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	416	Helicopter	Clearcut w/ retention
D	95	416	Helicopter	Clearcut w/ retention
E	95	416	Helicopter	Clearcut w/ retention
F	95	416	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N boundary (MM1 main channel) and lower end of HC5 channel on NE side. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Deeply incised HC5 (upstream of Class II) and HC6 channels on E and W boundaries and stream between the two blocks are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III streams. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention for 95% of volume, helicopter yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: See Hydrology and Fisheries.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut with retention, helicopter yarding.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

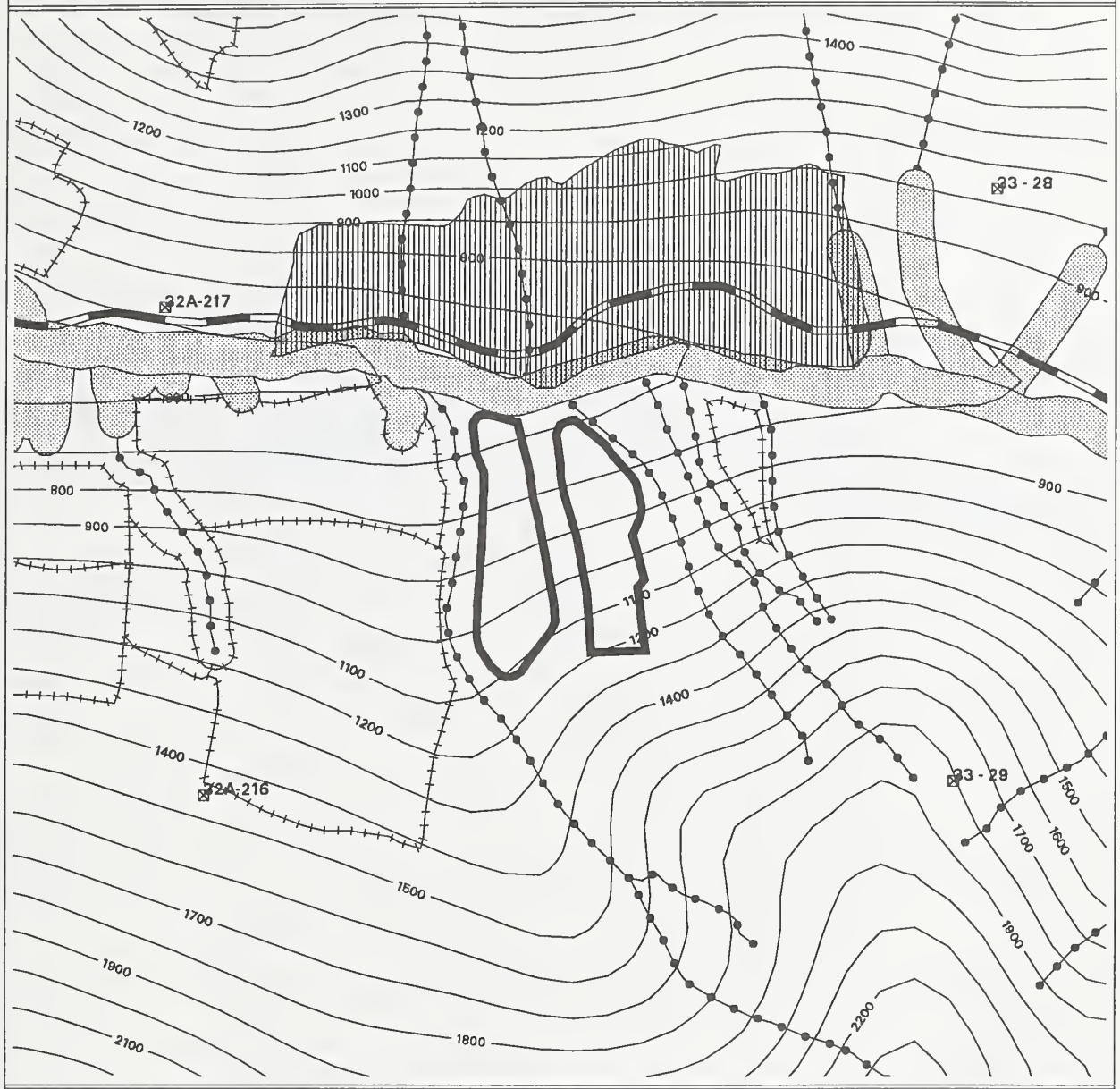
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22210 QUAD(s): SITD5NE

ACRES: 22 Unit 22210 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 22230 VCU: 2221
ACRES: 3.5 VOLUME (MBF): 78

ALTERNATIVE SUMMARY

ALTERNATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	74	Helicopter	Clearcut w/ retention
D	95	74	Helicopter	Clearcut w/ retention
E	95	74	Helicopter	Clearcut w/ retention
F	95	74	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N boundary (MM1 channel). Maintain buffers on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Protect incised HC5 and HC6, Class III, category B streams on E and W boundaries as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention. Helicopter yarding.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Windfirm boundary on an east side V-notch.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

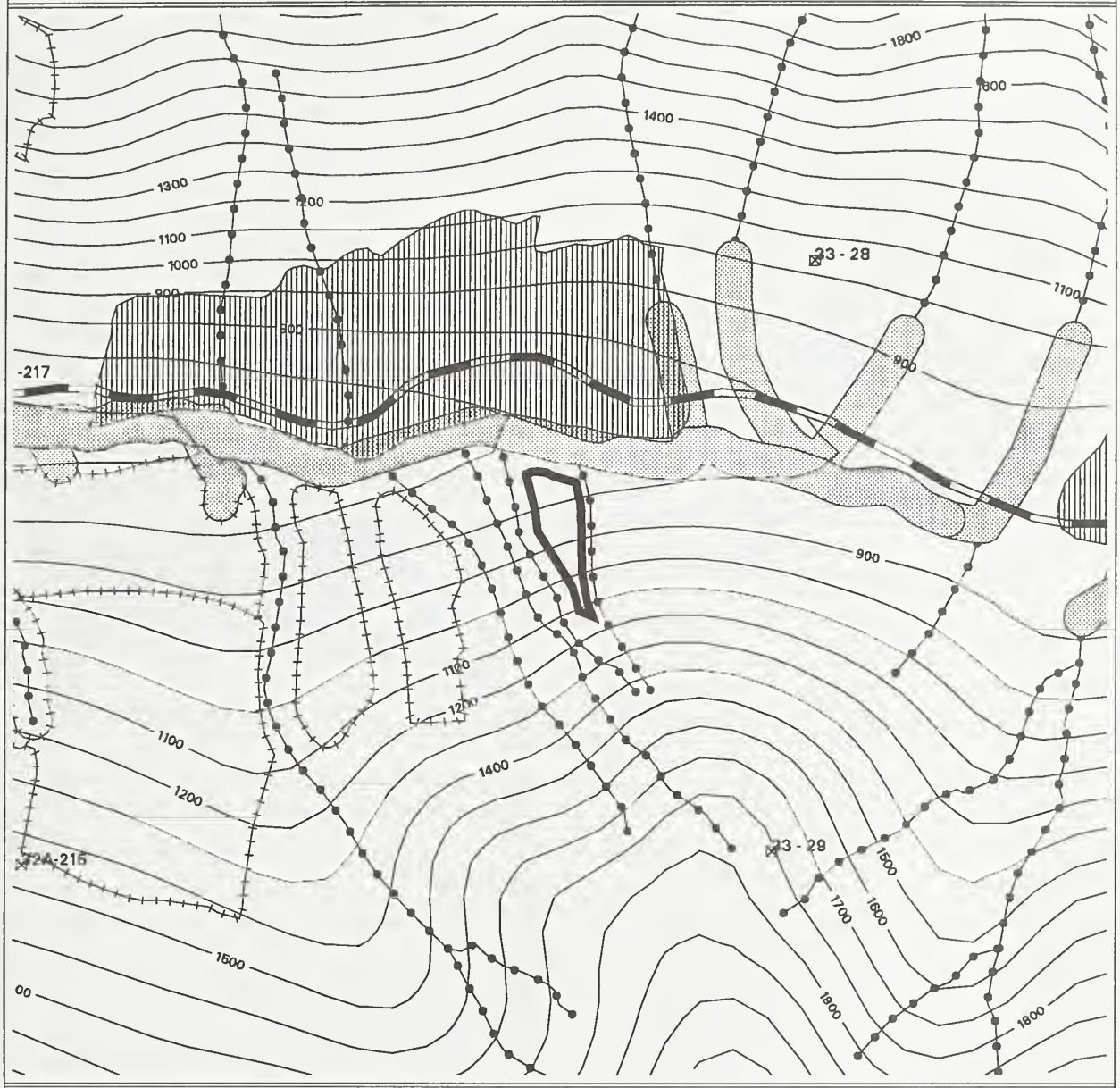
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2221 UNIT NUMBER: 22230 QUAD(s): SITD5NE

ACRES: 4 Unit 22230 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 05/2051

INDIAN RIVER UNIT CARD

UNIT: 60420 VCU: 2160
ACRES: 22.1 VOLUME (MBF): 736

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	700	Cable	Clearcut w/ retention
D	95	700	Cable	Clearcut w/ retention
F	95	700	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along E and W boundaries of larger block. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Existing blowdown on east side of this area next to old clearcut is a concern. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffers to increase probability that they will remain windfirm along HC2 and HC3 buffers, especially the east side of them. Upstream of HC2, the HC6 channel between the two blocks is Class III, category B stream. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class II streams. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Split-yard v-notches and leave a windfirm boundary on west side.

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Clearcut, cable yarding.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

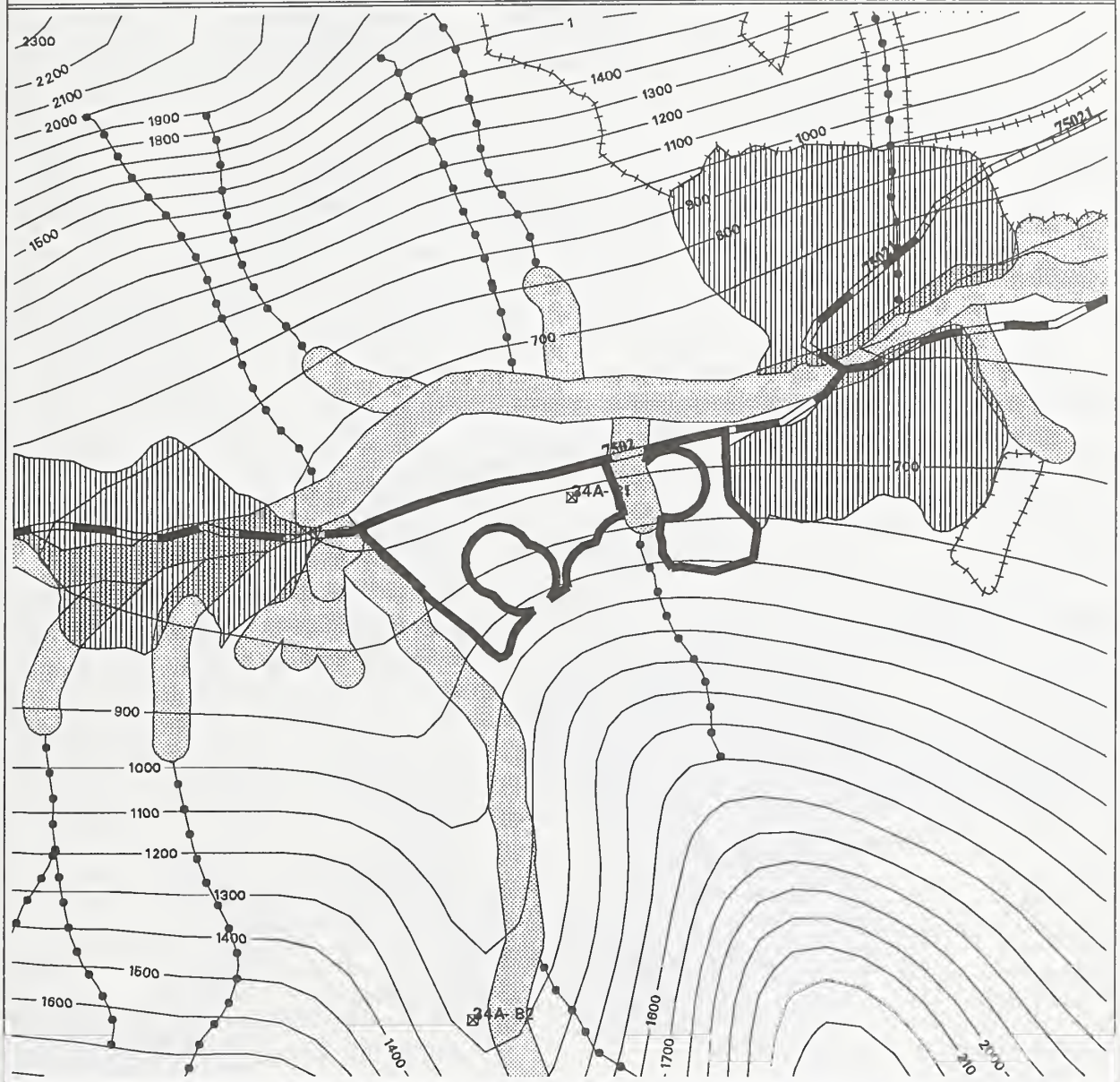
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60420 QUAD(s): SITD5NE

ACRES: 22 Unit 60420 Occurs in Alternatives: C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/01/01

INDIAN RIVER UNIT CARD

UNIT: 60710 VCU: 2160
ACRES: 58.8 VOLUME (MBF): 1235

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	247	Helicopter	Group Selection
D	20	247	Helicopter	Group Selection
E	20	247	Helicopter	Group Selection
F	20	247	Helicopter	Group Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Group selection for 20% of volume to ensure regeneration. Helicopter yarding.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain root strength and protect shallow soils to ensure regeneration.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Group selection due to risk of blowdown.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

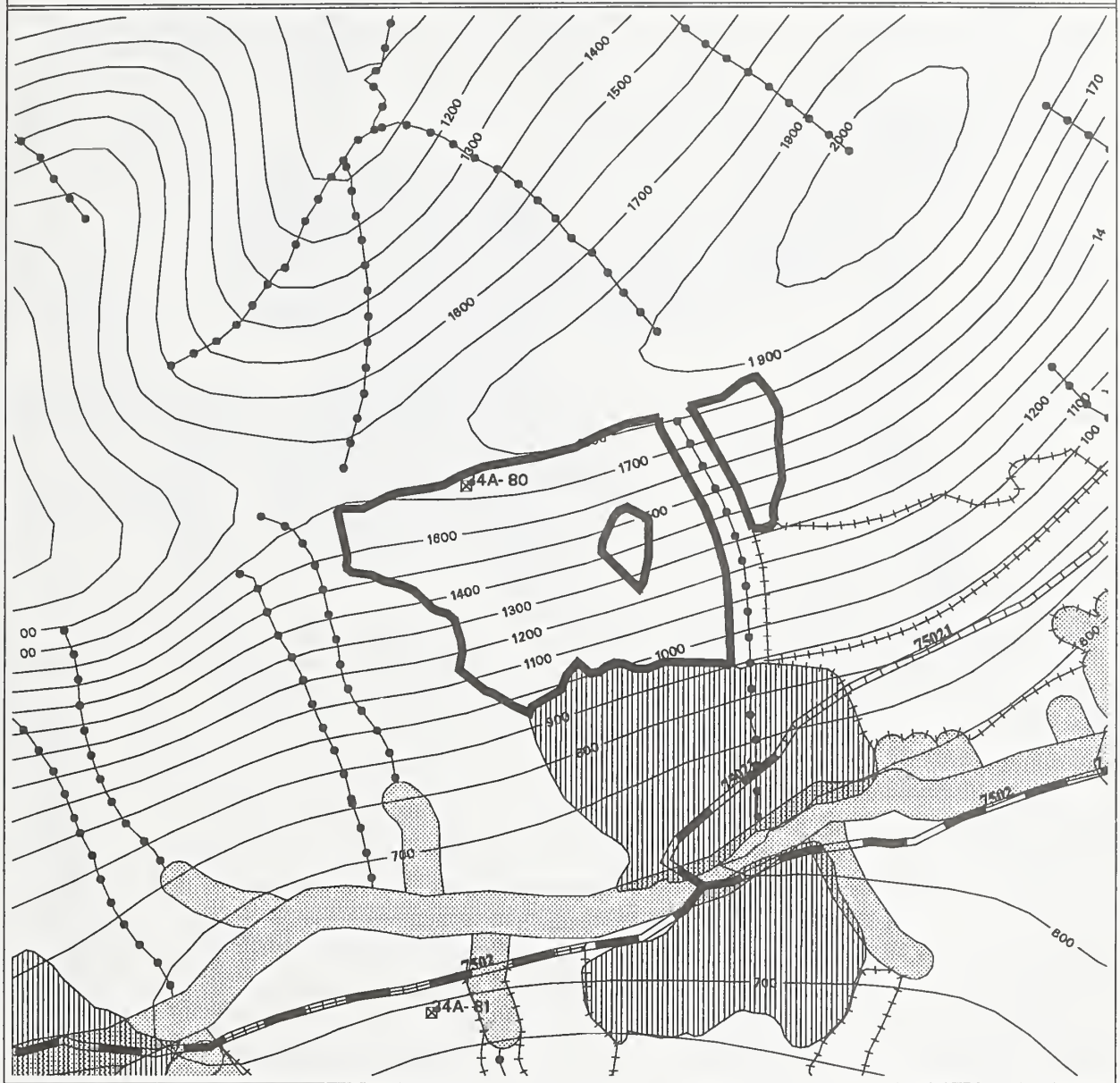
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Inactive goshawk nest site in area. Survey for goshawks as funding allows. If active nest is located, implement TES goshawk S&G J.1.a)(1-6)b)c). Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60710 QUAD(s): SITD5NE

ACRES: 59 Unit 60710 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 60810 VCU: 2160
ACRES: 4.5 VOLUME (MBF): 127

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	120	Helicopter	Clearcut w/ retention
D	95	120	Helicopter	Clearcut w/ retention
E	95	120	Helicopter	Clearcut w/ retention
F	95	120	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Helicopter yarding.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP.

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60810 QUAD(s): SITD5NE

ACRES: 5 Unit 60810 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 60910 VCU: 2160
ACRES: 10.5 VOLUME (MBF): 84

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	79	Helicopter	Clearcut w/ retention
D	95	79	Helicopter	Clearcut w/ retention
E	95	79	Helicopter	Clearcut w/ retention
F	95	79	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics. Maintain adequate wildlife corridors.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Buffer on Class II stream in lower center of unit. Stream is not currently entered into the GIS database. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams (Class II) along lower N boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Class III, HC6 channels on SE and W boundaries are category B; protect as per BMP 13.16 (and 13.3). Place unit boundary at or above slope break of Class III channels (2/3 rule) to provide windfirm boundaries. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with regeneration islands.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON , M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

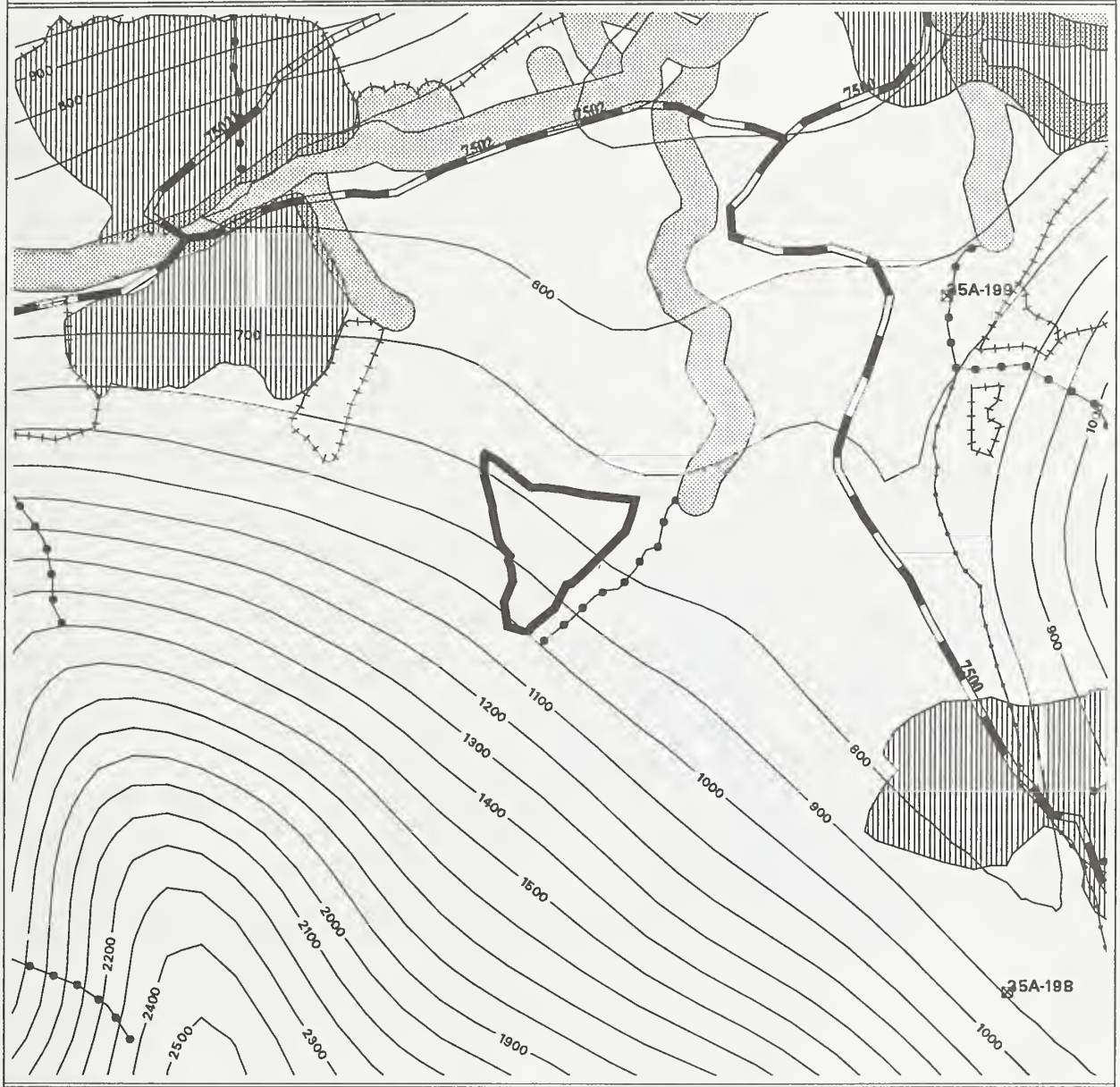
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 60910 QUAD(s): SITD5NE

ACRES: 10 Unit 60910 Occurs in Alternatives: C D E F


900
800
700
600
1100
1200
1300
1400
1500
2000
2100
2200
2400
2500
2300
1900
1000
75M
75M
75M

INDIAN RIVER UNIT CARD

UNIT: 61011 VCU: 2160
ACRES: 18.4 VOLUME (MBF): 413

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	83	Helicopter	Group Selection
C	40	165	Helicopter	Patch Clearcut
D	40	165	Helicopter	Patch Clearcut
F	40	165	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including large floodplain (FP4), Class I channel and associated secondary channels, and Class II AF1 channels on lower SE, NE, and SW boundaries. Maintain buffers on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC6 channels on NE and SW boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 channels.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Helicopter harvest, group selection.

{ SOILS } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

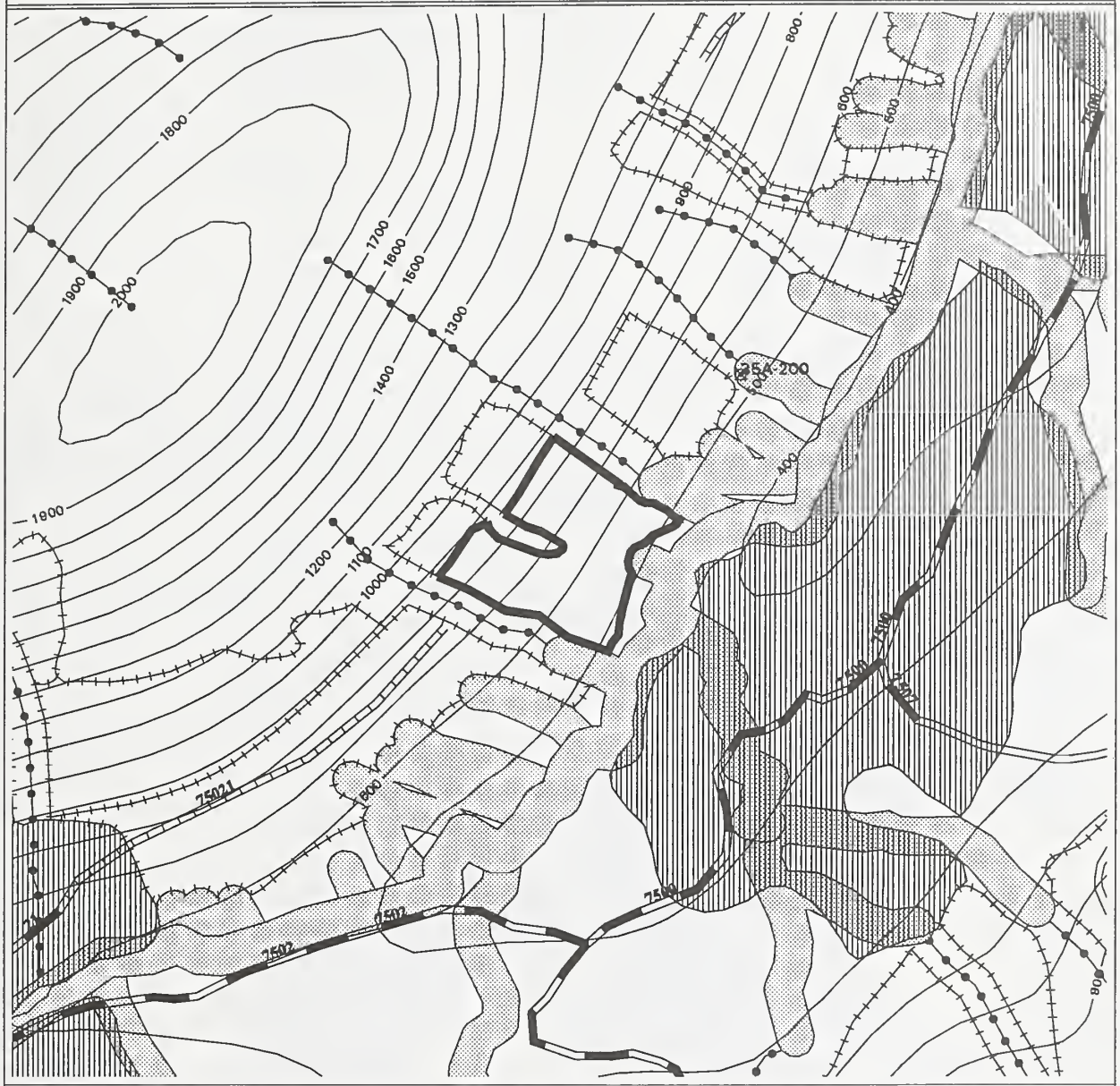
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: Partial harvest to maintain travel corridor.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61011 QUAD(s): SITD5NE/SITD4NW

ACRES: 18 Unit 61011 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/98

INDIAN RIVER UNIT CARD

UNIT: 61012 VCU: 2160
ACRES: 9.7 VOLUME (MBF): 182

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	36	Helicopter	Group Selection
C	40	73	Helicopter	Patch Clearcut
D	40	73	Helicopter	Patch Clearcut
E	20	36	Helicopter	Group Selection
F	20	36	Helicopter	Group Selection

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including floodplain FP4, Class I channel, associated secondary channels, and Class I/II AF1, HC2 and FSO channels along lower SE boundary. Implement buffers on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep lower unit boundary uphill of slope break, where FSO channels upwell. HC6 channels on NE and SW boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Helicopter harvest, group selection.

{ **SOILS** } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

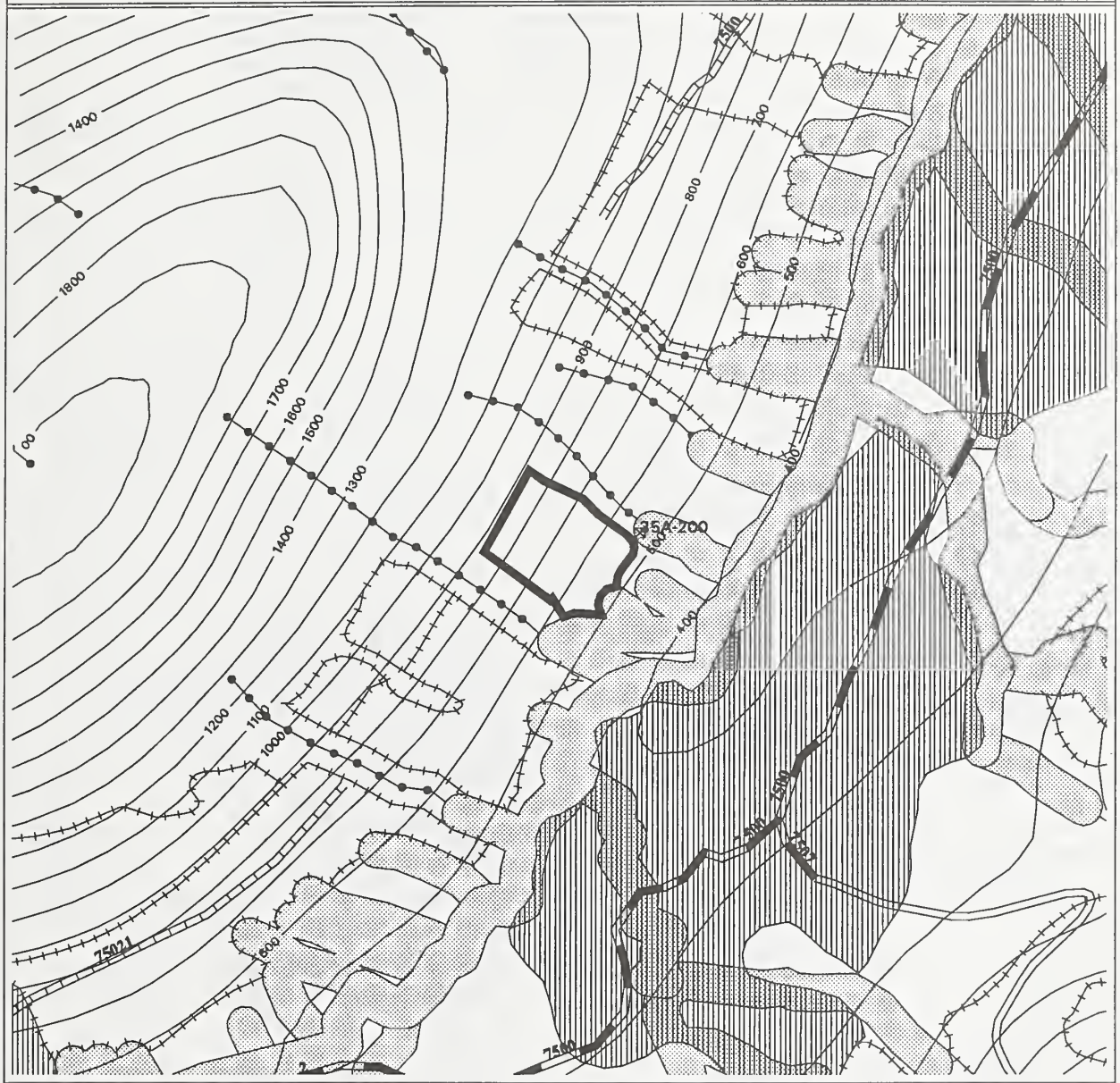
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Partial harvest to maintain travel corridor. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61012 QUAD(s): SITD4NW

ACRES: 10 Unit 61012 Occurs in Alternatives: B C D E F


1400
1800
1700
1800
1500
1300
1400
1200
1100
1000
900
800
700
600
500
400
300
7500
7500
7500

INDIAN RIVER UNIT CARD

UNIT: 61020 VCU: 2160
ACRES: 26.3 VOLUME (MBF): 491

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	98	Helicopter	Group Selection
C	20	98	Helicopter	Group Selection
D	20	98	Helicopter	Group Selection
E	20	98	Helicopter	Group Selection.
F	20	98	Helicopter	Group Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat; moderate survey priority. Botanist present during layout.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: About 9 Class III and IV streams, category B and C, extend uphill from the Class I/II streams identified near the valley bottom main channel. Protect category B and C streams as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: Partial harvest to retain some root strength.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61020 QUAD(s): SITD5NE

ACRES: 26 Unit 61020 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 61030 VCU: 2160
ACRES: 34.9 VOLUME (MBF): 810

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	70	567	Helicopter	Overstory Removal
C	90/95	333/417	Cable	Clearcut w/ retention
D	90/95	333/417	Cable	Clearcut w/ retention
E	90/95	333/417	Cable	Clearcut w/ retention
F	90/95	333/417	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including upstream end of Class II habitat on smaller footslope (FSO) channels throughout the unit, and AF1 channel on NE boundary. Implement buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. Protect Class IV, category C streams that extend uphill from the Class II footslope streams per BMP 13.16 (and 13.3). Leave windfirm boundary on HC6 channel on NE boundary.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Partial suspension.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61030 QUAD(s): SITD5NE/SITD4NW

ACRES: 35 Unit 61030 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 04/20/93

INDIAN RIVER UNIT CARD

UNIT: 61040 VCU: 2160
ACRES: 8.6 VOLUME (MBF): 156

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	70	109	Helicopter	Overstory Removal
D	70	109	Helicopter	Overstory Removal
E	70	109	Helicopter	Overstory Removal
F	70	109	Helicopter	Overstory Removal

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to west side Class III stream. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Overstory removal of dominants for 70% of volume.

{ **SOILS** } FIELD REVIEW: F.GLENN APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

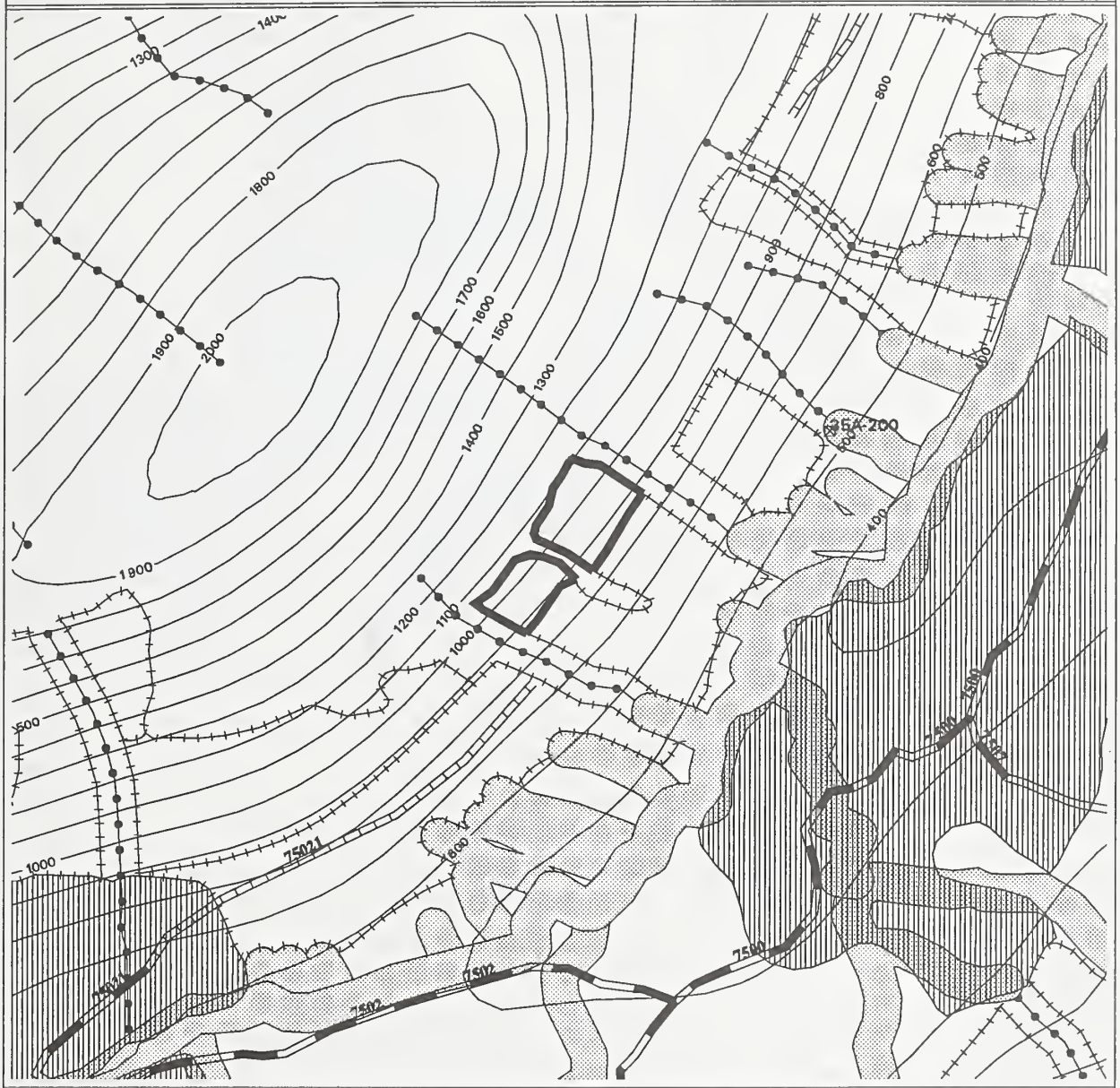
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61040 QUAD(s): SITD5NE/SITD4NW

ACRES: 9 Unit 61040 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 61310 VCU: 2160
ACRES: 11.8 VOLUME (MBF): 170

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	10/151	Cable	Clearcut w/ retention
C	90/95	10/151	Cable	Clearcut w/ retention
D	90/95	10/151	Cable	Clearcut w/ retention
E	90/95	10/151	Cable	Clearcut w/ retention
F	90/95	10/151	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower N and W boundaries. These include the main valley bottom MM2 (Class I), a small footslope Class II channel (FSO) in center of unit and HC2 and HC3 channels on the NE and W boundaries. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerImns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61310 QUAD(s): SITD5NE

ACRES: 12 Unit 61310 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 61311 VCU: 2160
ACRES: 1.6 VOLUME (MBF): 30

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	29	Cable	Clearcut w/ retention
D	95	29	Cable	Clearcut w/ retention
E	95	29	Cable	Clearcut w/ retention
F	95	29	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower N and W boundaries. These include the valley bottom, Class I, MM2 channel, a footslope Class II channel (FSO) on the W boundary and an HC2 channel on the NE boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61311 QUAD(s): SITD5NE

ACRES: 2 Unit 61311 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 61410 VCU: 2160
ACRES: 22.6 VOLUME (MBF): 619

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	531	Cable	Clearcut w/ retention
C	95	531	Shovel	Clearcut w/ retention
D	95	531	Shovel	Clearcut w/ retention
E	95	531	Shovel	Clearcut w/ retention
F	95	531	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams all along lower N boundary next to valley bottom MM2/MC2 channel (Class I), and the two HC2 and two FSO (small footslope) channels within the unit. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. The area (below the road) adjacent to the main channel buffer should be feathered (remove larger trees, retain smaller trees) to increase the probability that the buffer will remain windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Shovel yarding.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61410 QUAD(s): SITD5NE

ACRES: 23 Unit 61410 Occurs in Alternatives: B C D E F



·100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 61510 VCU: 2160
ACRES: 29.6 VOLUME (MBF): 770

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	732	Helicopter	Clearcut w/ retention
C	95	732	Cable	Clearcut w/ retention
D	95	732	Cable	Clearcut w/ retention
E	95	732	Cable	Clearcut w/ retention
F	95	732	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including two small footslope, Class II streams (FSO) in middle of unit, lower end of HC6 channel on W boundary, and the main MM2 channel along lower NW boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep lower unit boundary at uphill side of muskeg benches. Leave windfirm boundary along HC6 and HC3 channels on W and E boundaries.

{ HERITAGE } FIELD REVIEW: P.BOWER APPROVED BY: K.IWAMOTO
REMARKS: No concerns.

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Decadent.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in middle of unit, for alternatives C, D, E, F

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: Recommend cable system.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

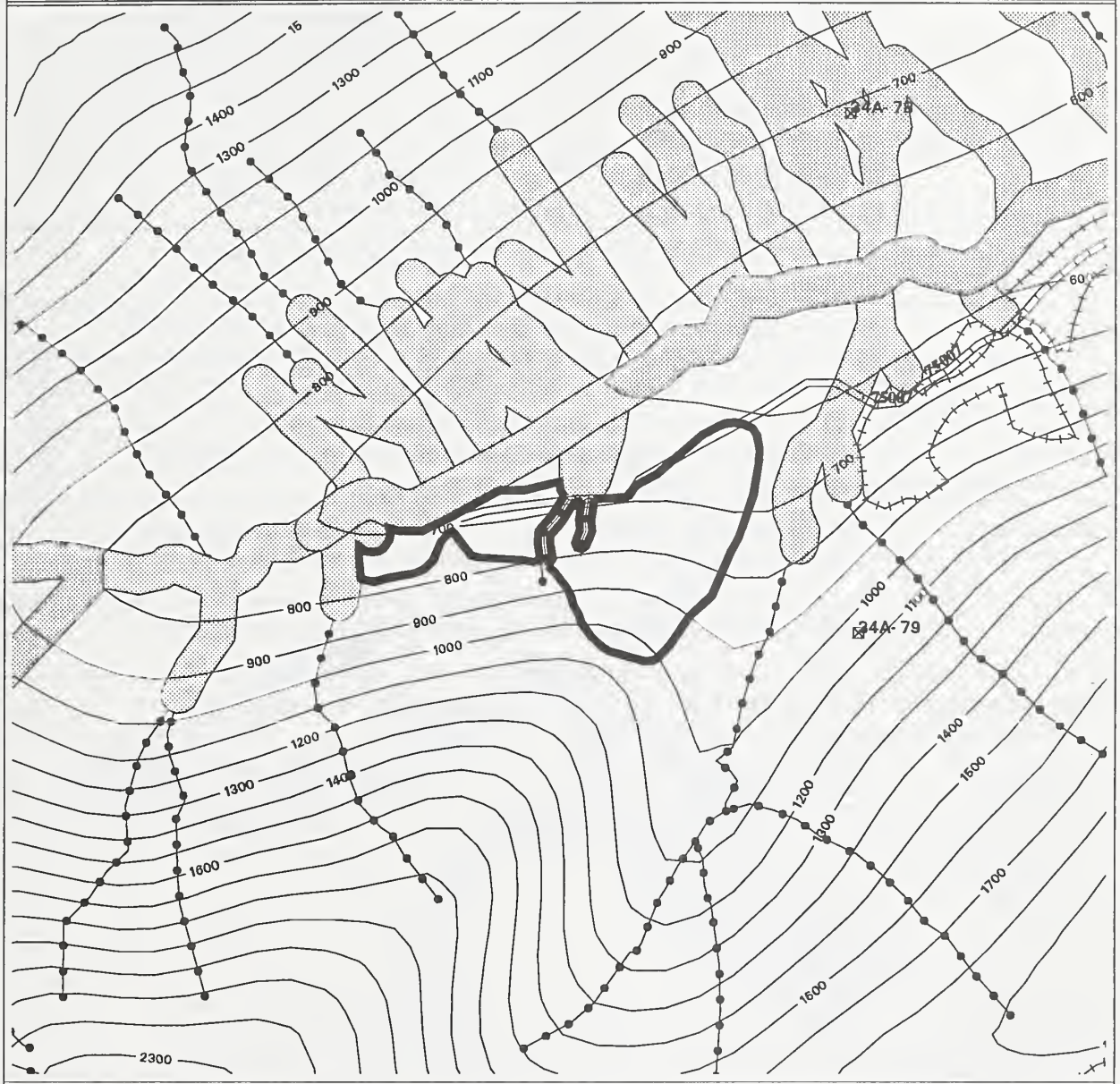
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 61510 QUAD(s): SITD5NE

ACRES: 30 Unit 61510 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 62610 VCU: 2041
ACRES: 34.3 VOLUME (MBF): 663

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	133	Helicopter	Group Selection
C	80	530	Cable	Overstory Removal
D	95	630	Cable	Clearcut w/ retention
F	95	630	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: On lower SE corner, maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. See hydrology for additional remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream for cc alt. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Additional landings in NW corner may be needed.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

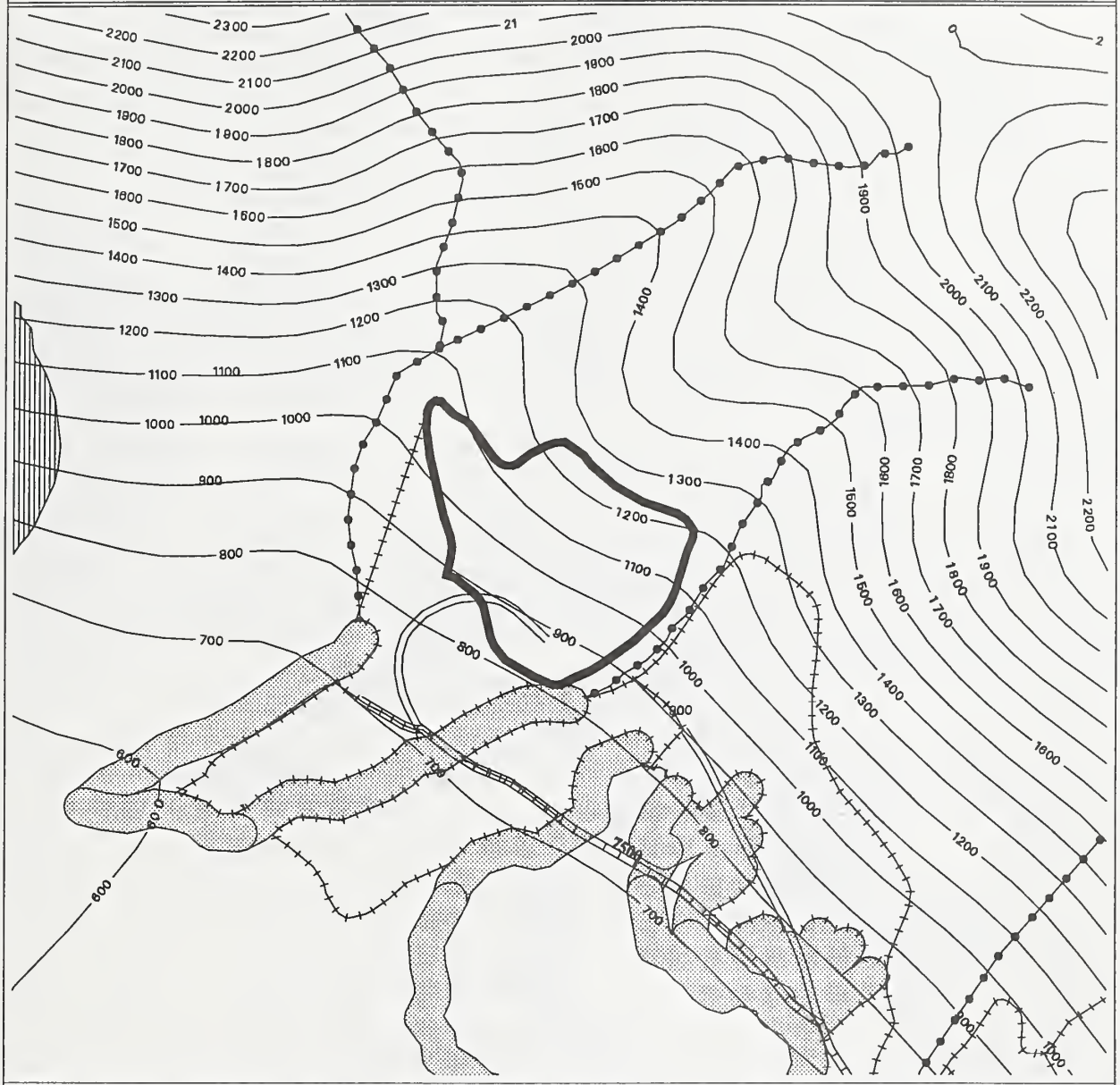
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62610 QUAD(s): SITD5NE

ACRES: 34 Unit 62610 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 62611 VCU: 2041
ACRES: 19.9 VOLUME (MBF): 722

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	144	Helicopter	Group Selection
C	90/95	13/671	Shovel	Clearcut w/ retention
D	90/95	13/671	Shovel	Clearcut w/ retention
F	90/95	13/671	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including AF1 and MM1 channels on SE and SW boundaries. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Protect deeply incised Class III, category B, HC channel (upstream of MM1) as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class II streams. (Feathering) (BMP 12.6a; 13.16). Windfirm boundaries can be established by feathering buffer or by harvesting trees having less than 2/3 of their height lying below the channel slope break. Northwest winds can be severe along the vortex ridge sideslope. Northerlies can be funneled through the gorge section of upper Freshwater Valley.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

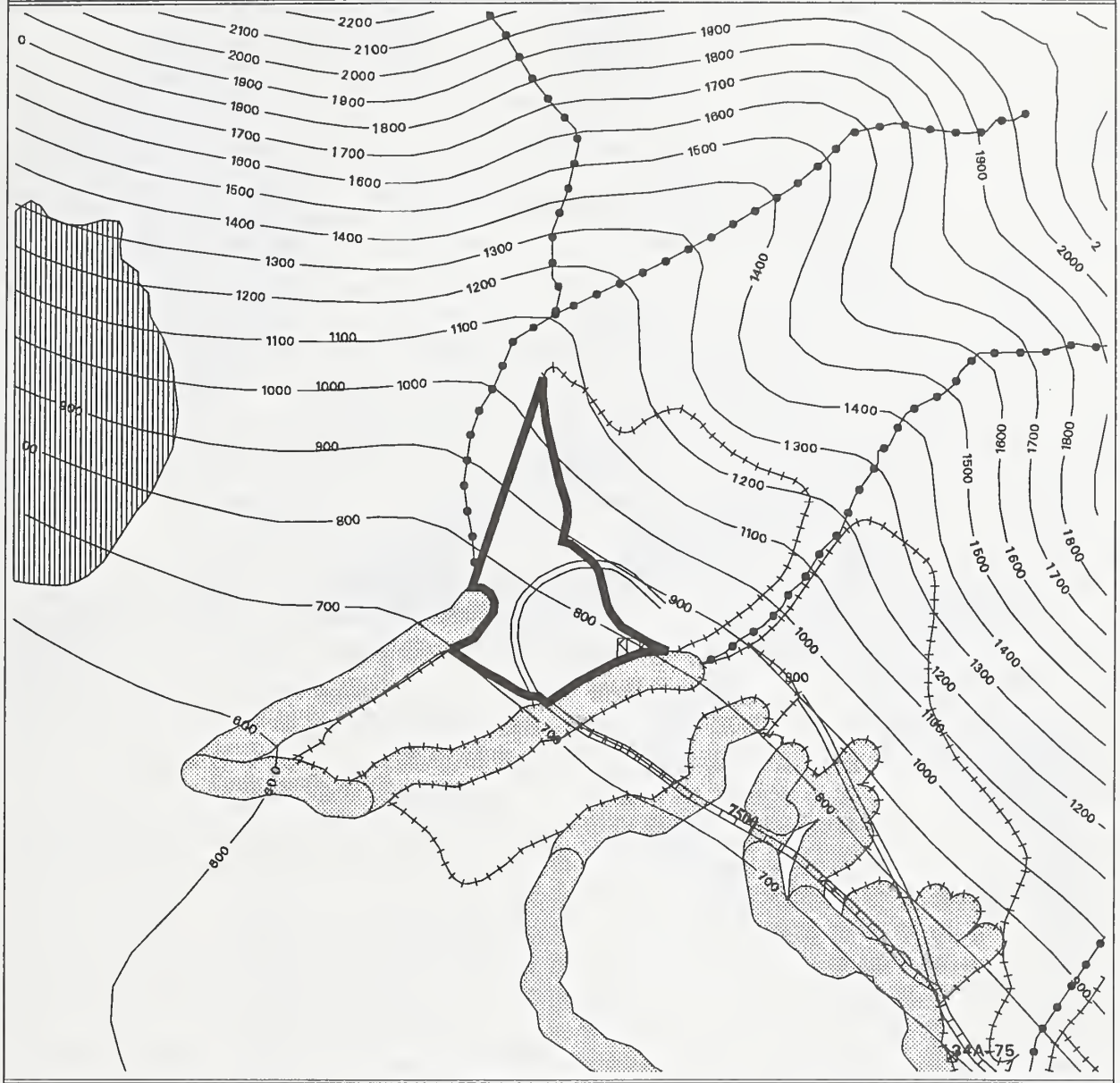
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas will provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S& IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62611 QUAD(s): SITD5NE

ACRES: 20 Unit 62611 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 62620 VCU: 2041
ACRES: 10.8 VOLUME (MBF): 412

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	82	Helicopter	Group Selection
C	20	82	Shovel	Single Tree Selection
D	20	82	Shovel	Single Tree Selection
F	80	330	Shovel	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along all but the upper NE boundary. This includes MM1 channels along NW and SW boundaries and AF1 channel along SE boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. If >60% harvest, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to Class II streams for OR alt. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62620 QUAD(s): SITD5NE

ACRES: 11 Unit 62620 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/98

INDIAN RIVER UNIT CARD

UNIT: 62630 VCU: 2041
ACRES: 15.3 VOLUME (MBF): 582

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	116	Helicopter	Group Selection
C	20	116	Shovel	Single Tree Selection
D	20	116	Shovel	Single Tree Selection
F	40	233	Shovel	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along all but the uphill NE boundary. This includes an AF1 channel on the NW boundary and a smaller palustrine (PAO)/ floodplain (FPO) channel along the SE boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep SW and SE boundaries uphill out of fen wetland areas (BMP 12.5).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

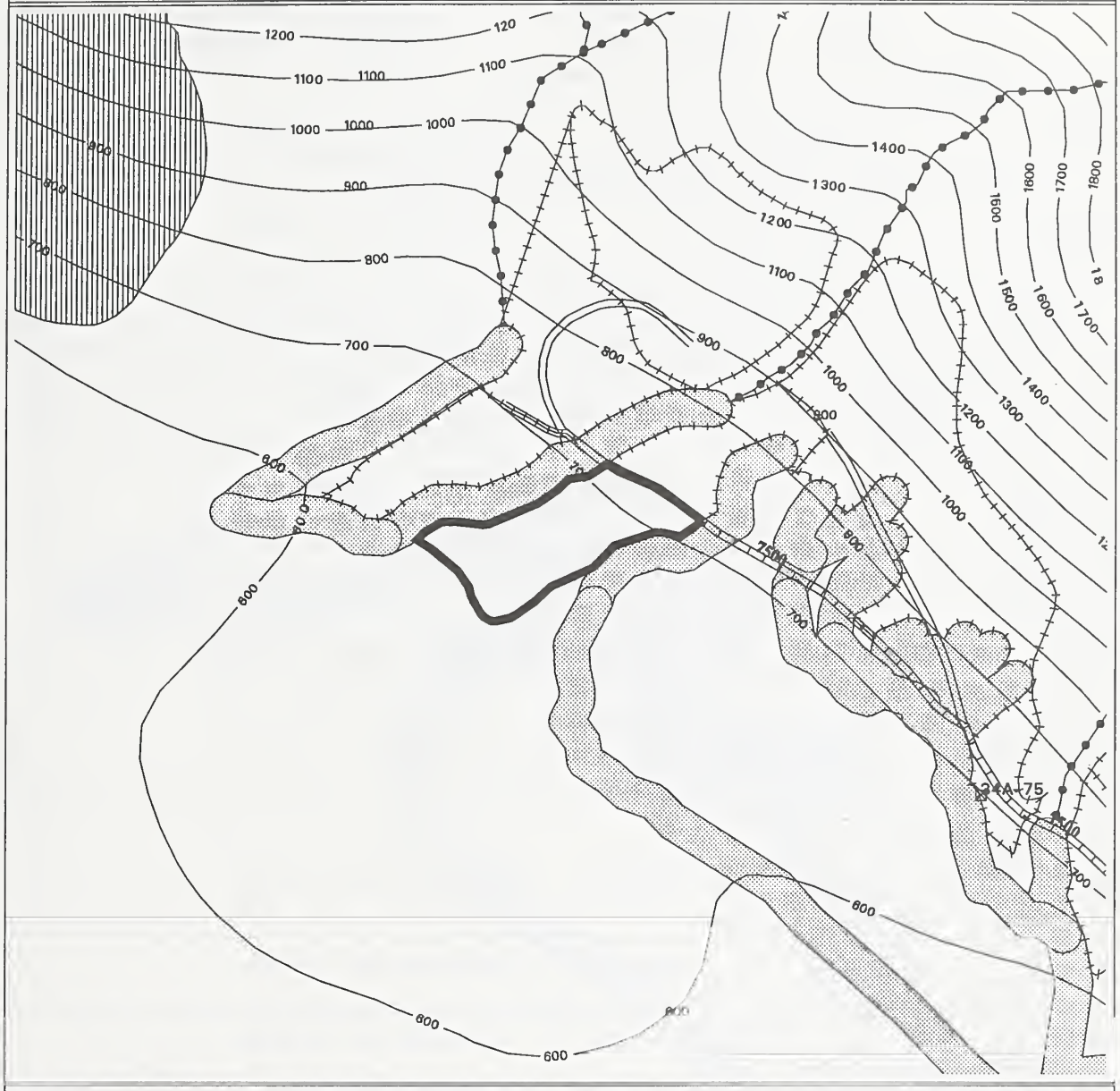
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Survey for active sharp-shinned hawk nest as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62630 QUAD(s): SITD5NE

ACRES: 15 Unit 62630 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 62640 VCU: 2041
ACRES: 8.8 VOLUME (MBF): 334

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	67	Helicopter	Group Selection
C	90/95	117/193	Cable	Clearcut w/ retention
D	90/95	117/193	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including an AF1 channel on the NW boundary and an FSO/PAO channel and adjacent wetland (fen) area along the SE boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary on AF1 channel. Keep SE boundary out of wetland-fen area (BMP 12.5). Upstream of AF1 channel, protect the Class III, category B, HC channel as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundaries to streams for Alternatives C and D. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041 UNIT NUMBER: 62640 QUAD(s): SITD5NE

ACRES: 9 Unit 62640 Occurs in Alternatives: B C D



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 62650 VCU: 2041/2160
ACRES: 44.8 VOLUME (MBF): 908

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	182	Helicopter	Group Selection
C	90/95	97/760	Cable	Clearcut w/ retention
D	90/95	97/760	Cable	Clearcut w/ retention
E	90/95	97/760	Cable	Clearcut w/ retention
F	90/95	97/760	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams all along lower SW and S boundaries. These include about 8 FSO (small footslope) channels, a palustrine (PAO) channel and an MMO and HC2 channel along the south corner. Keep lower unit boundary upstream of Class I/II channels and fen wetland area (BMP 12.5). Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. The upstream Class III and IV area of some of these channels, along with the HC channels on the NW and SE boundaries, are category B or C streams. Protect per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream channel. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Partial suspension.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: Survey for Red-tailed hawk as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2041/2160 UNIT NUMBER: 62650 QUAD(s): SITD5NE

ACRES: 45 Unit 62650 Occurs in Alternatives: B C D E F



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 62710 VCU: 2160
ACRES: 20.9 VOLUME (MBF): 533

ALTERNATIVE SUMMARY

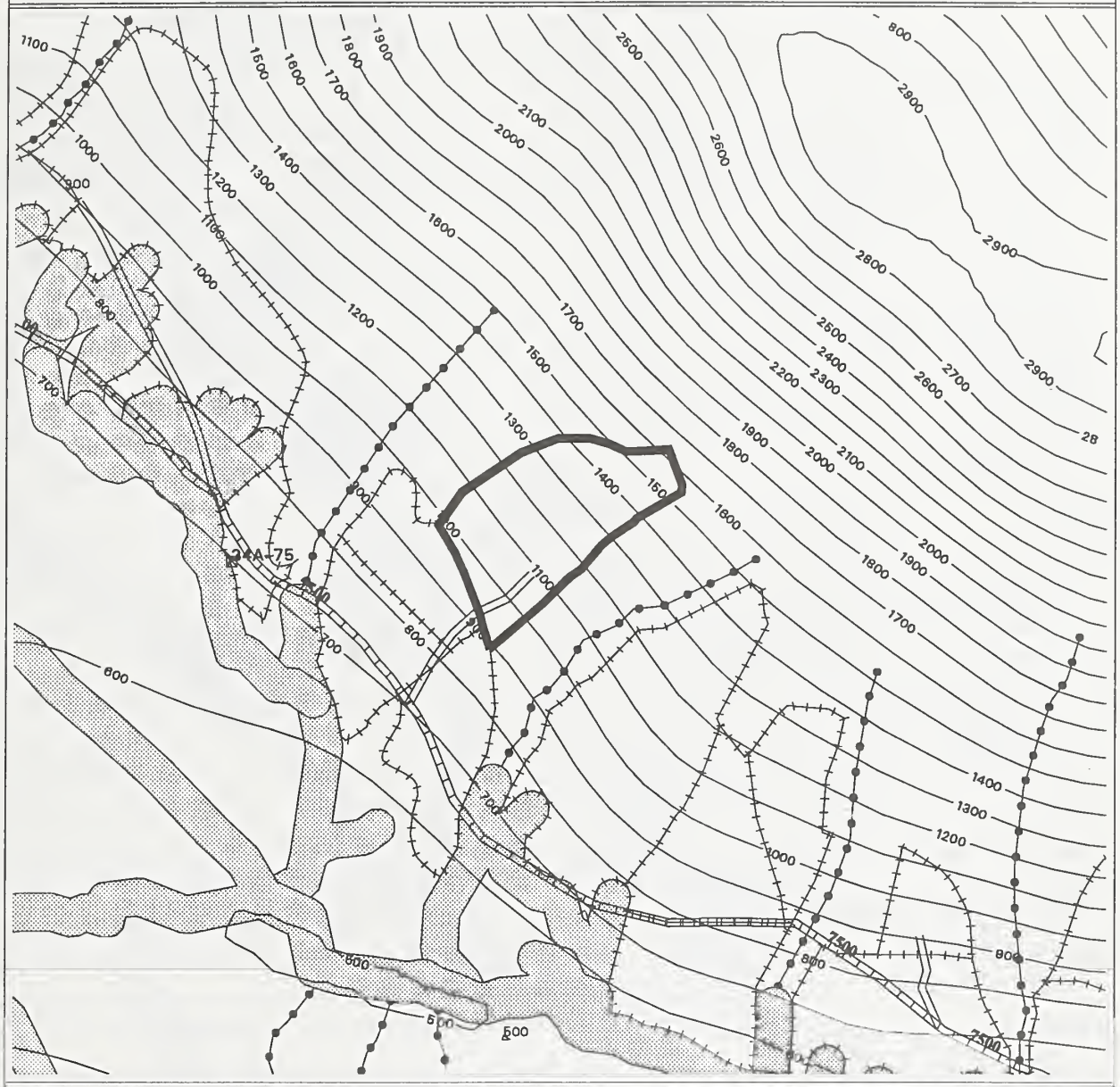
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	506	Cable	Clearcut w/ retention
C	95	506	Cable	Clearcut w/ retention
D	95	506	Cable	Clearcut w/ retention
E	95	506	Cable	Clearcut w/ retention
F	95	506	Cable	Clearcut w/ retention

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: No concerns.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: No concerns.
{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Survey for raptor nest as funding allows. If active nest is located, implement W/L raptor nest S&G X.A.1-3. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62710 QUAD(s): SITD5NE

ACRES: 21 Unit 62710 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 62720 VCU: 2160
ACRES: 9.2 VOLUME (MBF): 168

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	160	Cable	Clearcut w/ retention
E	95	160	Cable	Clearcut w/ retention

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER REMARKS: No concerns.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: BMP 13.16.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL REMARKS: Partial suspension.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN REMARKS: No concerns.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62720 QUAD(s): SITD5NE

ACRES: 9 Unit 62720 Occurs in Alternatives: B E



Plotted 05/2001

INDIAN RIVER UNIT CARD

UNIT: 62730 VCU: 2160
ACRES: 12.2 VOLUME (MBF): 202

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	40	Helicopter	Group Selection
C	95	192	Cable	Clearcut w/ retention
D	95	192	Cable	Clearcut w/ retention
E	95	192	Cable	Clearcut w/ retention
F	95	192	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower SE and SW boundaries. These include a small footslope (FSO) channel near the muskeg/fen areas and an HC2 channel along the SE boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep unit above wetland-fen area on W side (BMP 12.5). Protect the Class III, category B HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3). Leave windfirm boundary .

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class II stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Cable yarding, partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

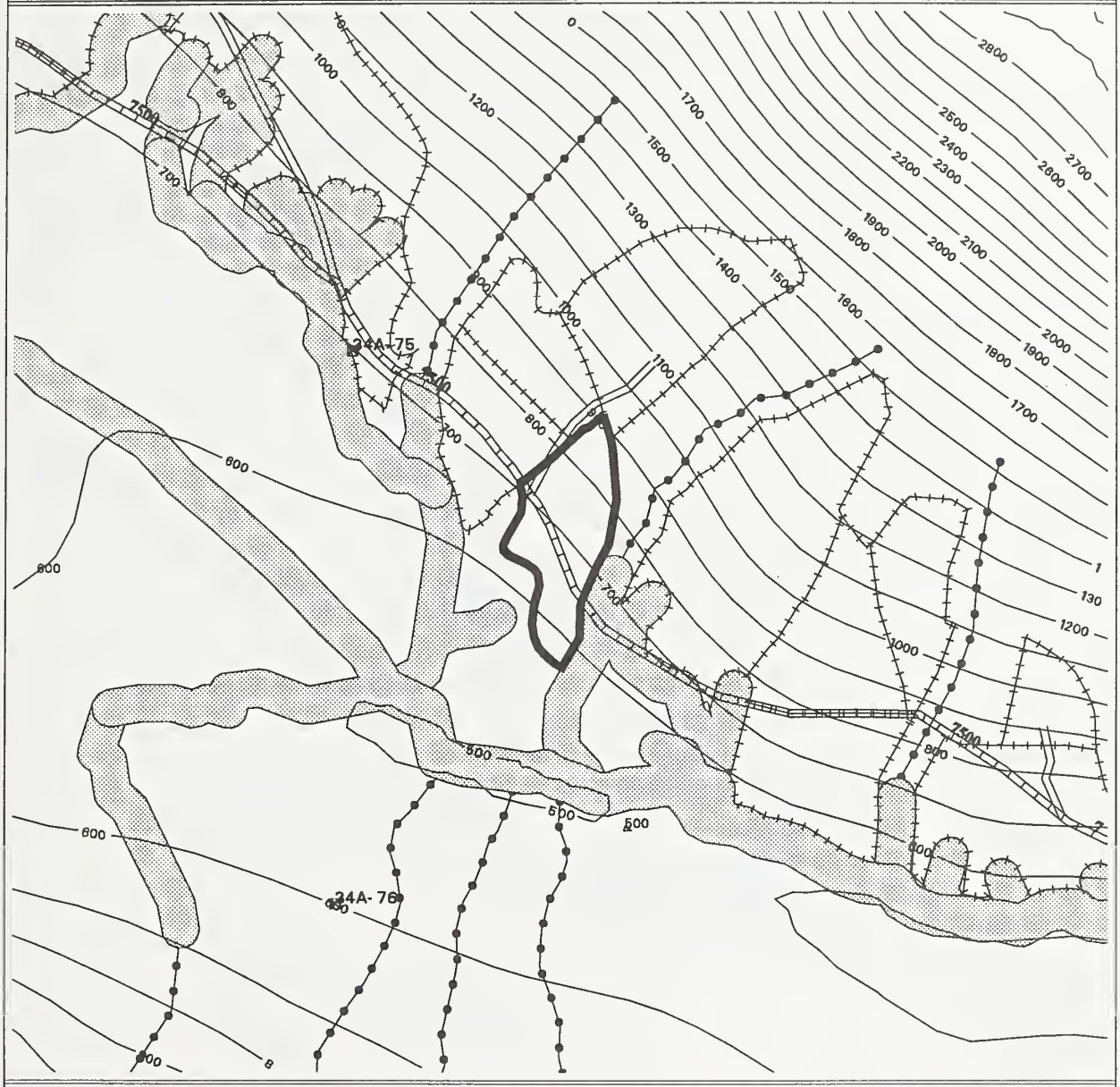
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62730 QUAD(s): SITD5NE

ACRES: 12 Unit 62730 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 62740 VCU: 2160
ACRES: 11.0 VOLUME (MBF): 194

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	39	Helicopter	Group Selection
E	95	185	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including HC2 and MM1 channel along W boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep unit above small wetland-fen area along SE boundary (BMP 12.5). Protect the Class III, category B, HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3). Leave windfirm boundary by placing unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Implement BMPs. Windfirm boundary to Class II stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: B.DOUGAN APPROVED BY: S.BEALL
REMARKS: Partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

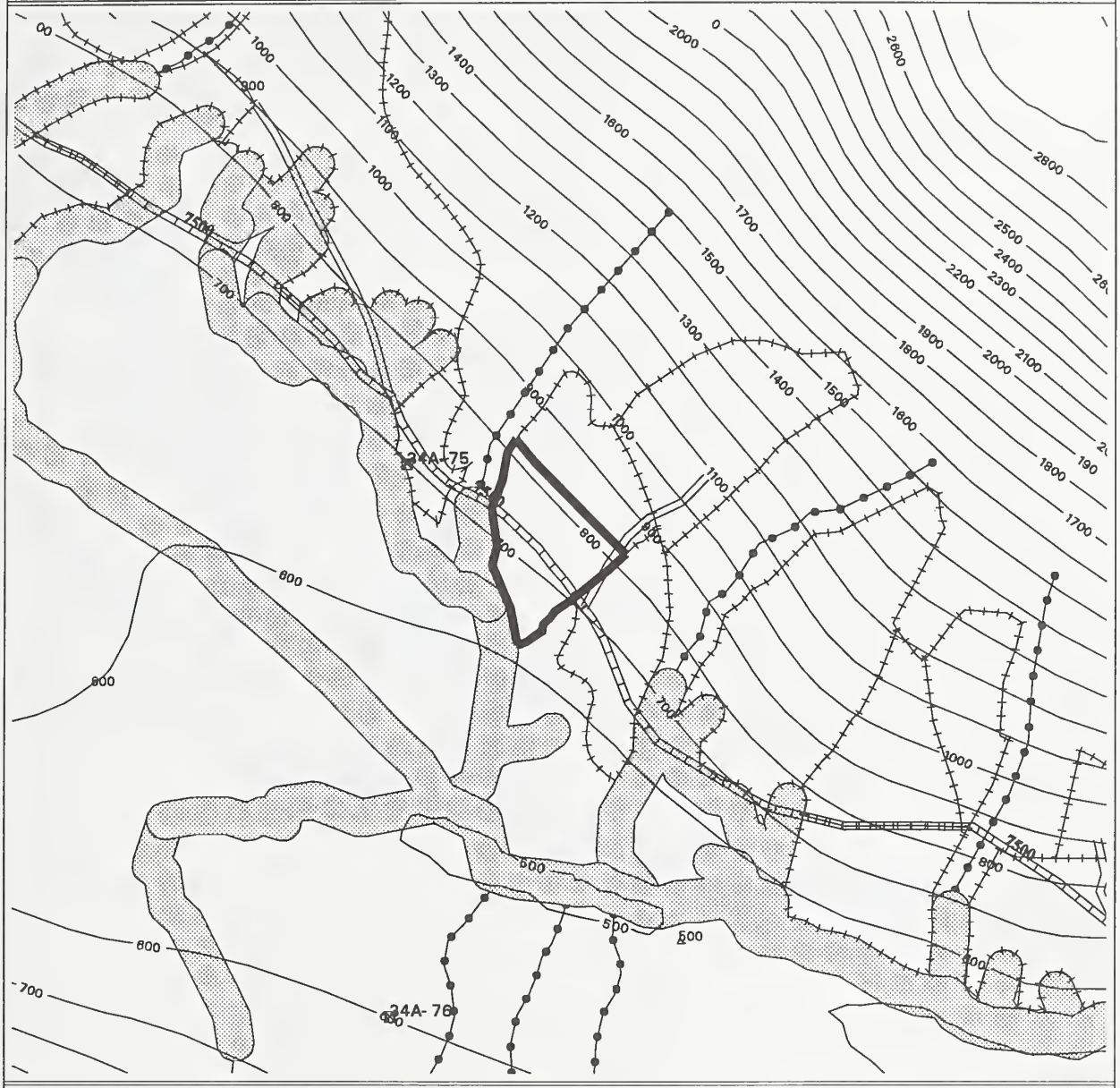
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62740 QUAD(s): SITD5NE

ACRES: 11 Unit 62740 Occurs in Alternatives: B E



Plotted 05/20/99

INDIAN RIVER UNIT CARD

UNIT: 62810 VCU: 2160
ACRES: 32.1 VOLUME (MBF): 559

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	115	Helicopter	Group Selection
C	90/95	28/501	Cable/Helicopter	Clearcut w/ retention
D	90/95	28/501	Cable/Helicopter	Clearcut w/ retention
F	40	230	Cable/Helicopter	Patch Clearcut

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including two small footslope (FSO) channels along lower S boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Protect Class III, category B, HC6 channel along NW boundary as per BMP 13.16 (and 13.3). Place unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream for Alternatives C and D. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut, partial suspension.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Windfirm buffer on channel northwest of unit.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

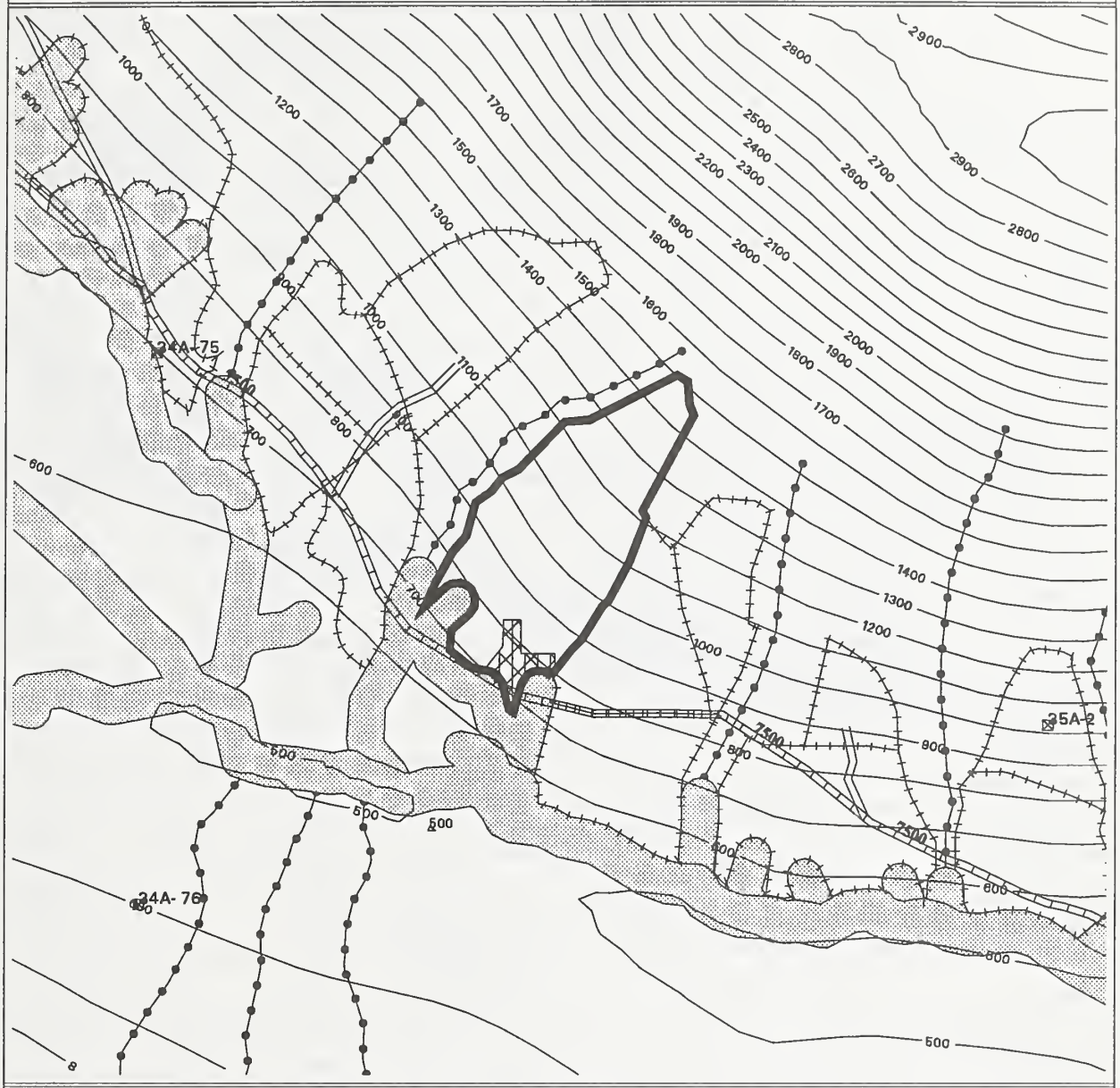
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY Implement
REMARKS:When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62810 QUAD(s): SITD5NE

ACRES: 32 Unit 62810 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 62820 VCU: 2160
ACRES: 14.2 VOLUME (MBF): 259

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	52	Helicopter	Group Selection
C	40	103	Cable	Patch Clearcut
D	40	103	Cable	Patch Clearcut
E	95	246	Cable	Clearcut w/ retention
F	95	246	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including MM2 valley bottom channel along lower S boundary, HC2 channel along SE boundary, and FSO channel along W boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a.; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along MM2 channel if harvest >60%. Protect Class III, category B, HC6 channel upstream of the HC2 channel as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to streams for Alts. E and F. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut, partial suspension.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

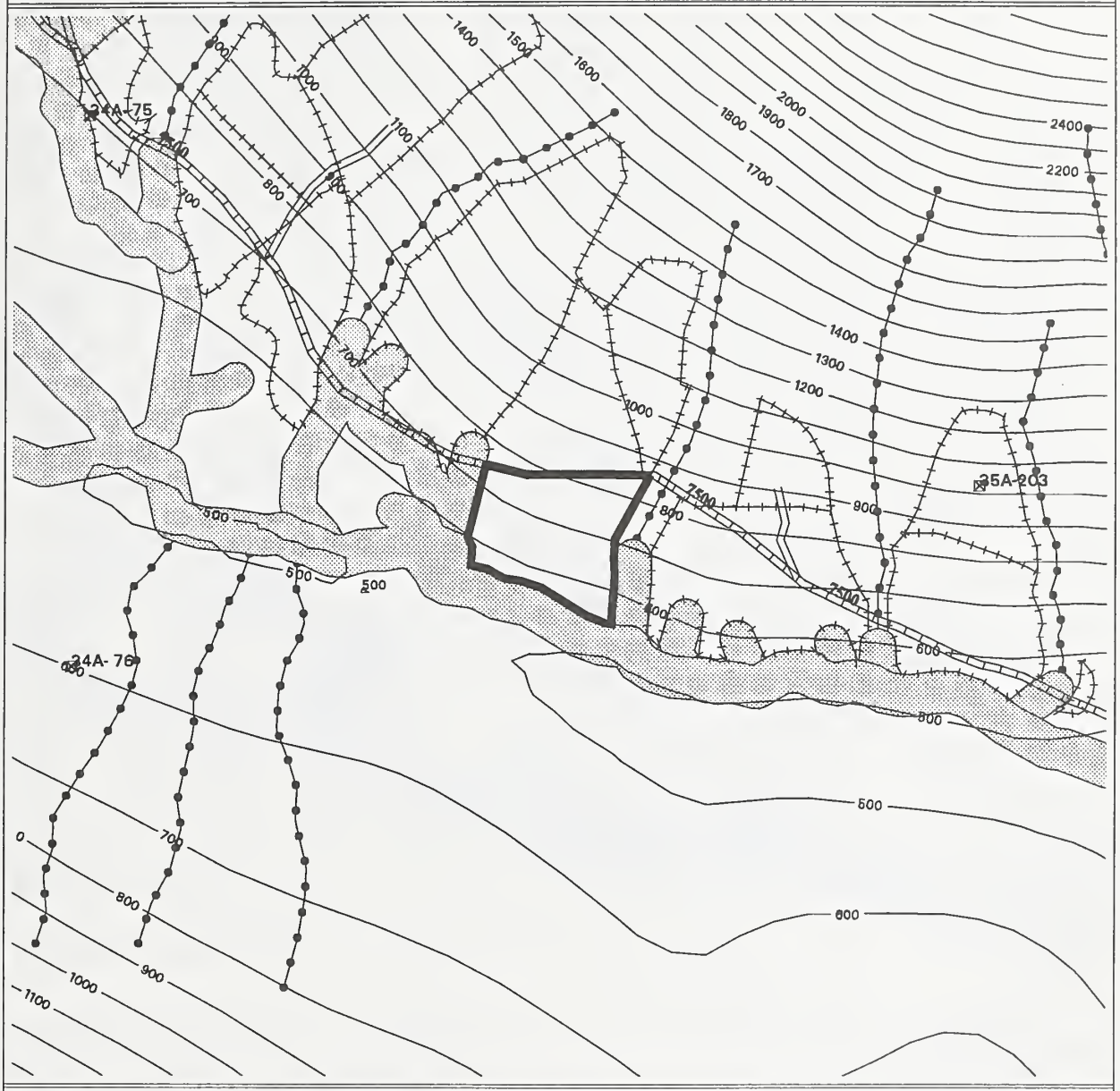
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62820 QUAD(s): SITD5NE

ACRES: 14 Unit 62820 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/91

INDIAN RIVER UNIT CARD

UNIT: 62830 VCU: 2160
ACRES: 9.9 VOLUME (MBF): 171

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	34	Helicopter	Group Selection
E	80	137	Helicopter	Overstory Removal
F	80	137	Helicopter	Overstory Removal

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER REMARKS: See hydrology/soils for remarks.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: Windfirm boundary to Class III stream for Overstory Removal alternative. (BMP 12.6a; 13.16).
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: Overstory removal. V-notches. Recommend windfirm boundary.
{ **SOILS** } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: Leave windfirm boundary on west side of unit and east side below brush field.
{ **TIMBER** } FIELD REVIEW: M.REGAN, S.GODFREY APPROVED BY: M.REGAN REMARKS: Helicopter harvest.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62830 QUAD(s): SITD5NE

ACRES: 10 Unit 62830 Occurs in Alternatives: B E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 62840 VCU: 2160
ACRES: 5.5 VOLUME (MBF): 100

ALTERNATIVE SUMMARY

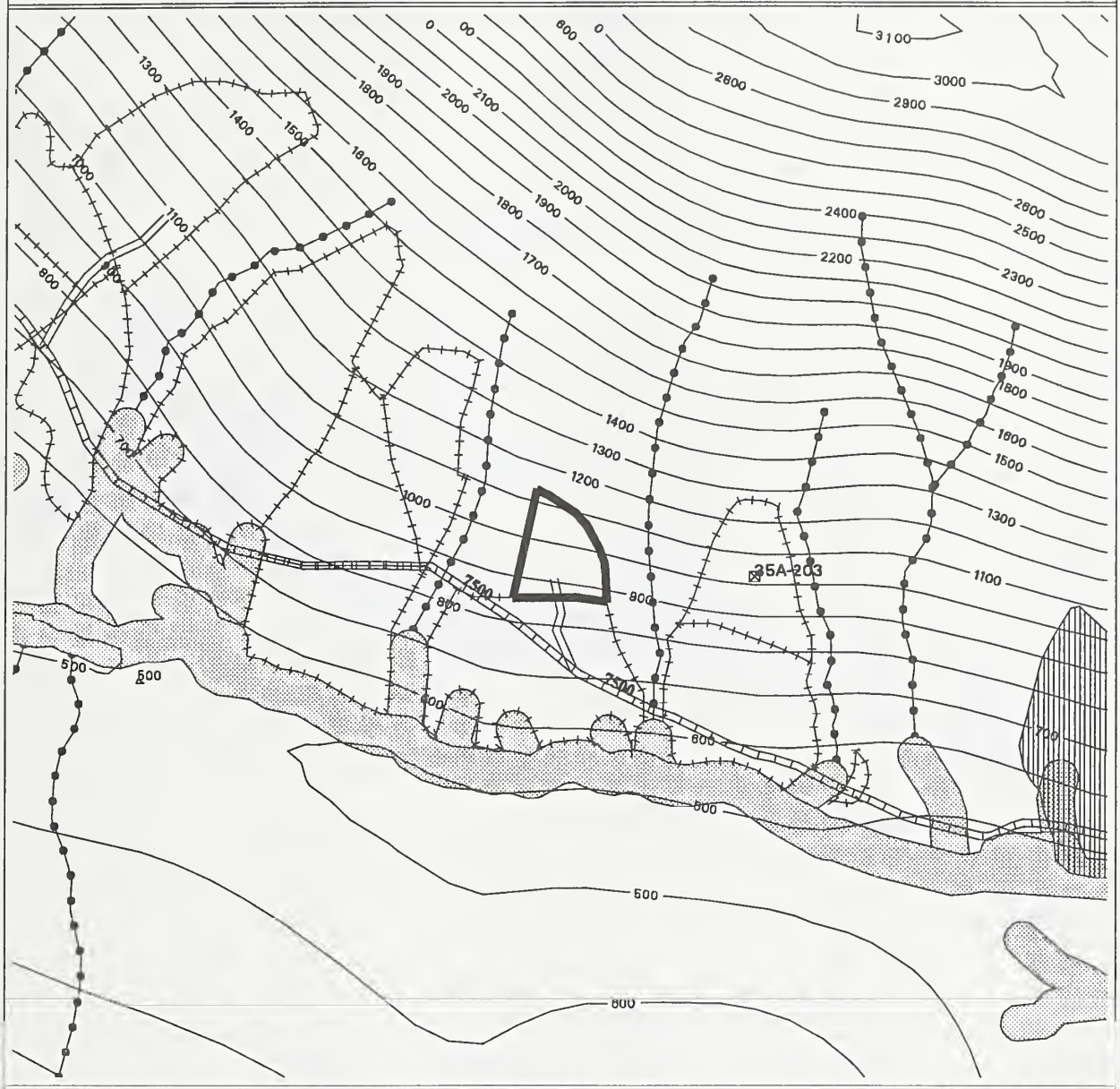
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	95	Cable	Clearcut w/ retention
C	95	95	Cable	Clearcut w/ retention
D	95	95	Cable	Clearcut w/ retention
E	95	95	Cable	Clearcut w/ retention
F	95	95	Cable	Clearcut w/ retention

REVIEW INFORMATION
{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER REMARKS: See soils for remarks.
{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: No concerns.
{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: Clearcut or overstory removal; soil(s), v-notches, split yard, windfirm boundary.
{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN REMARKS: Partial suspension to protect wet soils.
{ TIMBER } FIELD REVIEW: M.REGAN, S.GODFREY APPROVED BY: M.REGAN REMARKS: Clearcut, cable yarding.
{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62840 QUAD(s): SITD5NE/SITD4NW

ACRES: 5 Unit 62840 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 62850 VCU: 2160
ACRES: 19.6 VOLUME (MBF): 357

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	71	Helicopter	Group Selection
C	40	143	Cable	Patch Clearcut
D	40	143	Cable	Patch Clearcut
E	95	339	Cable	Clearcut w/ retention
F	40	143	Cable	Single Tree Selection

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams along lower S boundary. These include 3 small footslope (FSO) channels along S boundary, and HC2 channels along the SE and SW corners. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. For harvest >60%, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC5 and HC6 channels on upstream E and W boundaries are Class III, category B streams. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: NONE APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Split-yard v-notch in middle of unit.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62850 QUAD(s): SITD5NE/SITD4NW

ACRES: 20 Unit 62850 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY
ADJACENT UNIT
NEW SPEC. ROAD 1700
TEMPORARY ROAD
EXISTING SPEC. ROAD 1700
CLASS II STREAM
CLASS III STREAM

PHOTO POINT
EAGLE TREE
EXISTING CLEARCUTS
MARTEN HABITAT–HIGH VALUE
SALTWATER AND LAKES
CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 62860 VCU: 2160
ACRES: 13.7 VOLUME (MBF): 250

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	50	Helicopter	Group Selection
C	90/95	17/219	Cable/Helicopter	Clearcut w/ retention
D	90/95	17/219	Cable/Helicopter	Clearcut w/ retention
E	90/95	17/219	Cable/Helicopter	Clearcut w/ retention
F	90/95	17/219	Cable/Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: On small footslope channel (FSO) at SW corner, maintain buffer as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Upstream, this channel is Class III, category B and should be protected as per BMP 13.16 (and 13.3). Leave windfirm boundary ; place unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut, partial suspension.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along east side of unit.

{ TIMBER } FIELD REVIEW: NONE APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

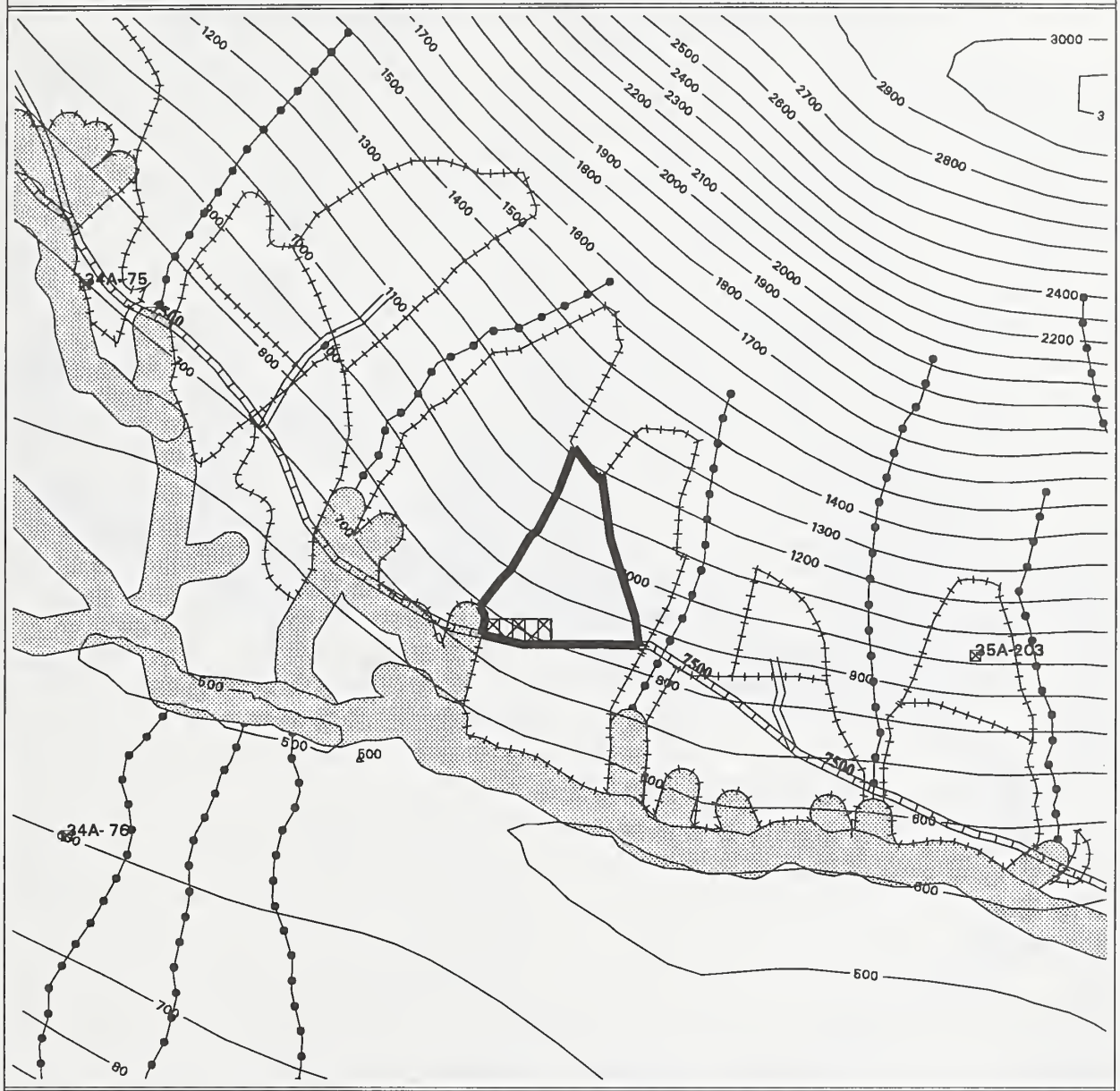
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 62860 QUAD(s): SITD5NE

ACRES: 14 Unit 62860 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

AREA LOCATOR



UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 63110 VCU: 2160
ACRES: 15.8 VOLUME (MBF): 288

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	58	Helicopter	Group Selection
C	90/95	182/80	Shovel	Clearcut w/ retention
D	90/95	182/80	Shovel	Clearcut w/ retention
E	90/95	182/80	Shovel	Clearcut w/ retention
F	90/95	182/80	Shovel	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams, including valley bottom MM2 channel, small footslope (FSO) channel and HC2 channel along lower S boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. For harvest >60%, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm. HC5 & HC6 channels on upstream W & E boundaries are Class III, category B streams. Protect per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule) for HC channels. [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS:Implement BMPs. Windfirm boundary to streams for Alts C,F.(BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

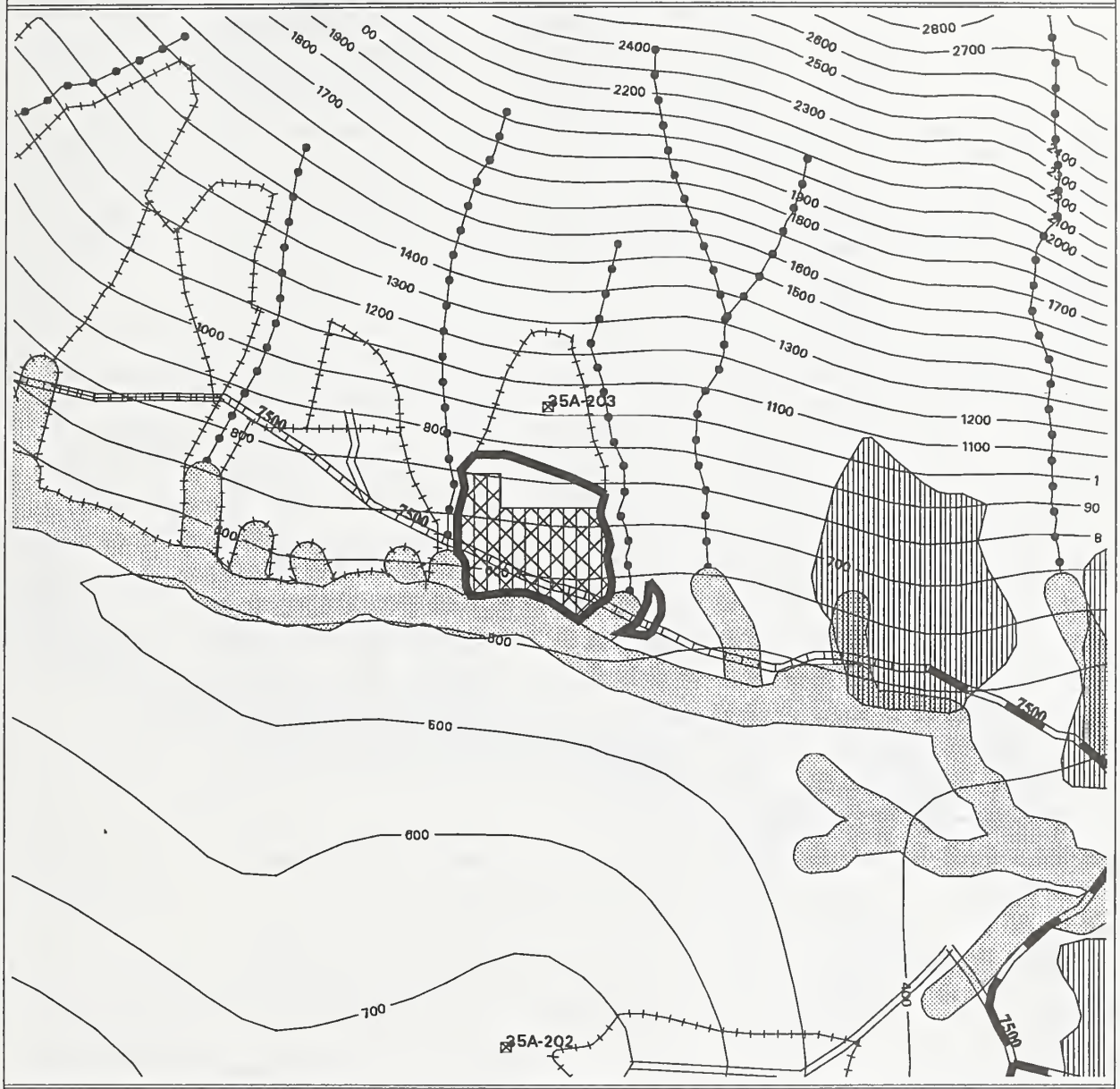
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: S.WOLF APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63110 QUAD(s): SITD4NW

ACRES: 16 Unit 63110 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 63120 VCU: 2160
ACRES: 9.4 VOLUME (MBF): 187

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	34	Helicopter	Group Selection
C	80	137	Helicopter	Overstory Removal
D	80	137	Helicopter	Overstory Removal
E	80	137	Helicopter	Overstory Removal
F	80	137	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: S.JACOBSON APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including HC2 and FSO channels along S half of small, west block. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Also, see hydrology remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Helicopter harvest, overstory removal.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON, M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

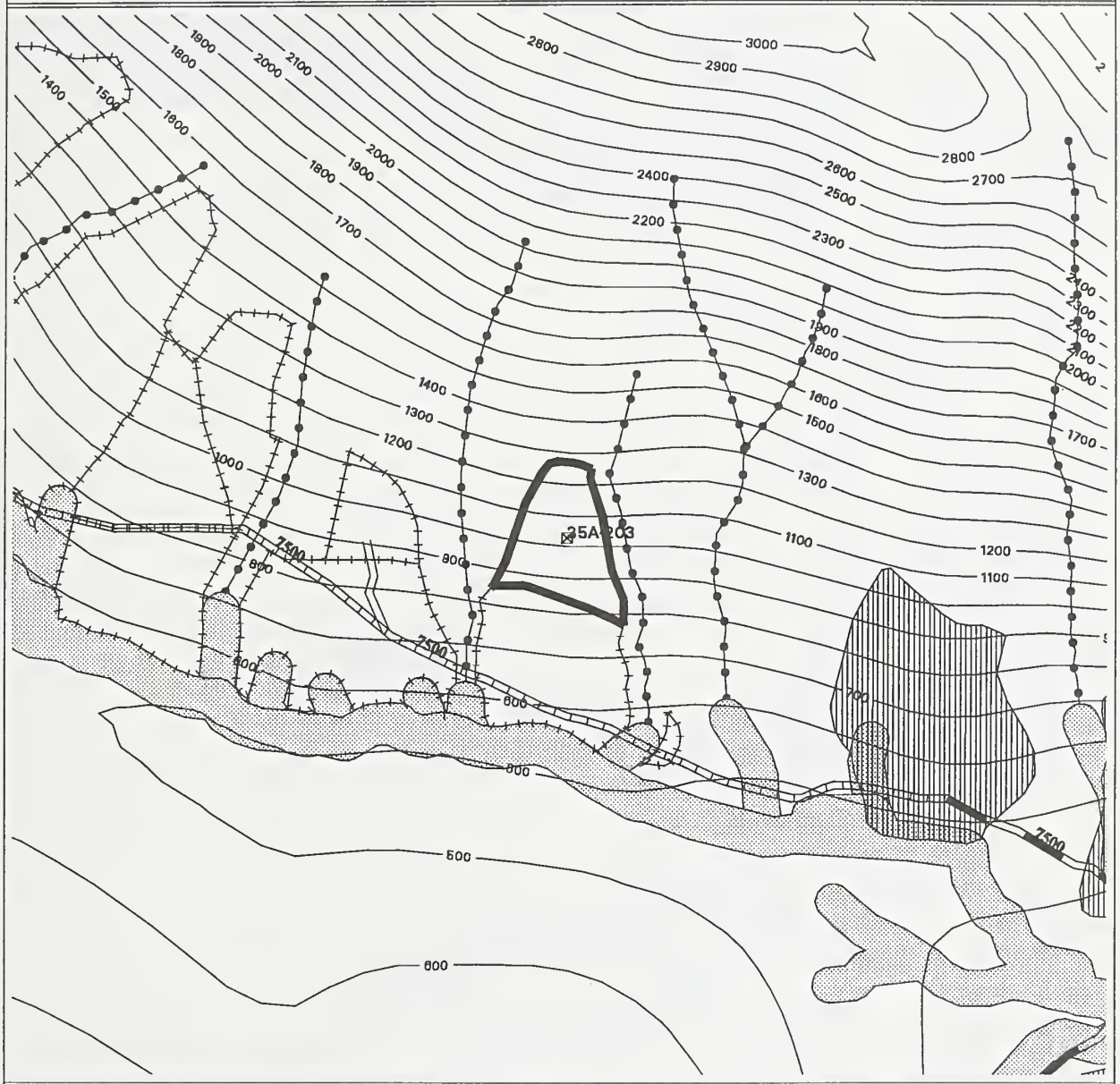
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63120 QUAD(s): SITD4NW

ACRES: 9 Unit 63120 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/91

INDIAN RIVER UNIT CARD

UNIT: 63510 VCU: 2160
ACRES: 18.8 VOLUME (MBF): 341

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	95	324	Cable	Clearcut w/ retention
D	95	324	Cable	Clearcut w/ retention
E	95	324	Cable	Clearcut w/ retention
F	95	324	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat; sensitive plants found in survey. Place reserves in swale areas with scattered sensitive plants and concentrating clearcuts in more productive timber. Botanist present at layout, and with road locators for temporary road to unit.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Keep unit out of wetland-fen areas along N, S, and W boundaries (BMP 12.5).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: No concerns.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Specialists review needed during layout if shovel yarding is proposed.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Track loader, swing yarder.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

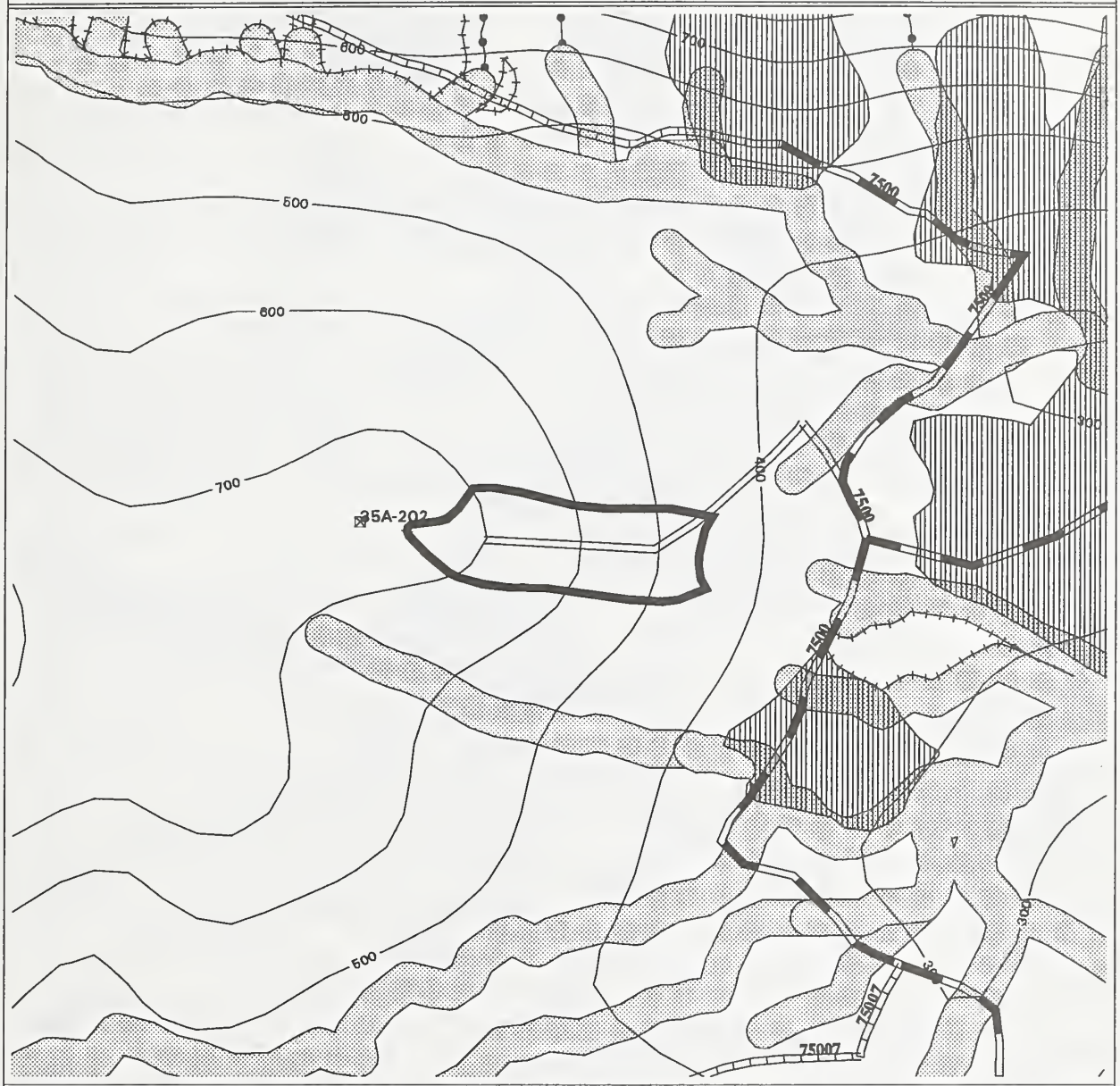
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63510 QUAD(s): SITD4NW

ACRES: 19 Unit 63510 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT--HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/94

INDIAN RIVER UNIT CARD

UNIT: 63520 VCU: 2160
ACRES: 6.2 VOLUME (MBF): 136

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	27	Cable	Patch Clearcut
C	50	68	Cable	Overstory Removal
D	50	68	Cable	Overstory Removal
E	20	27	Cable	Patch Clearcut
F	50	68	Cable	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A streams (Class I), including main channel FP4 along SE corner, & smaller (FPO) floodplain channels which nearly surround the planned unit. Maintain buffers on Class I, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Windfirmness of stream buffers with large trees surrounded by old clearcuts is a concern. Limit harvest to ≤ 50%, and where possible, feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability of remaining windfirm.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Plant spruce where necessary; feather buffers.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON, S.GODFREY APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63520 QUAD(s): SITD4NW

ACRES: 6 Unit 63520 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/98

INDIAN RIVER UNIT CARD

UNIT: 63820 VCU: 2160
ACRES: 50.5 VOLUME (MBF): 875

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	175	Helicopter	Group Selection
C	95	832	Helicopter	Clearcut w/ retention
D	95	832	Helicopter	Clearcut w/ retention
F	95	832	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including small footslope (FSO) channels along lower W and SW boundaries. Maintain buffers on Class I and II, Category A streams (including along large, incised MC3 channel on N boundary) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. HC6 and FSO channels that are Class III along N and W boundaries and within unit are category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule) between two larger blocks.[Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.] Keep lower W boundary of N block out of wetland-fen area (BMP 12.5).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary on north side of Class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = Low/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Helicopter or cable harvest, overstory removal or clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: J.STELICK APPROVED BY: M.REGAN
REMARKS: Clearcut or group selection, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

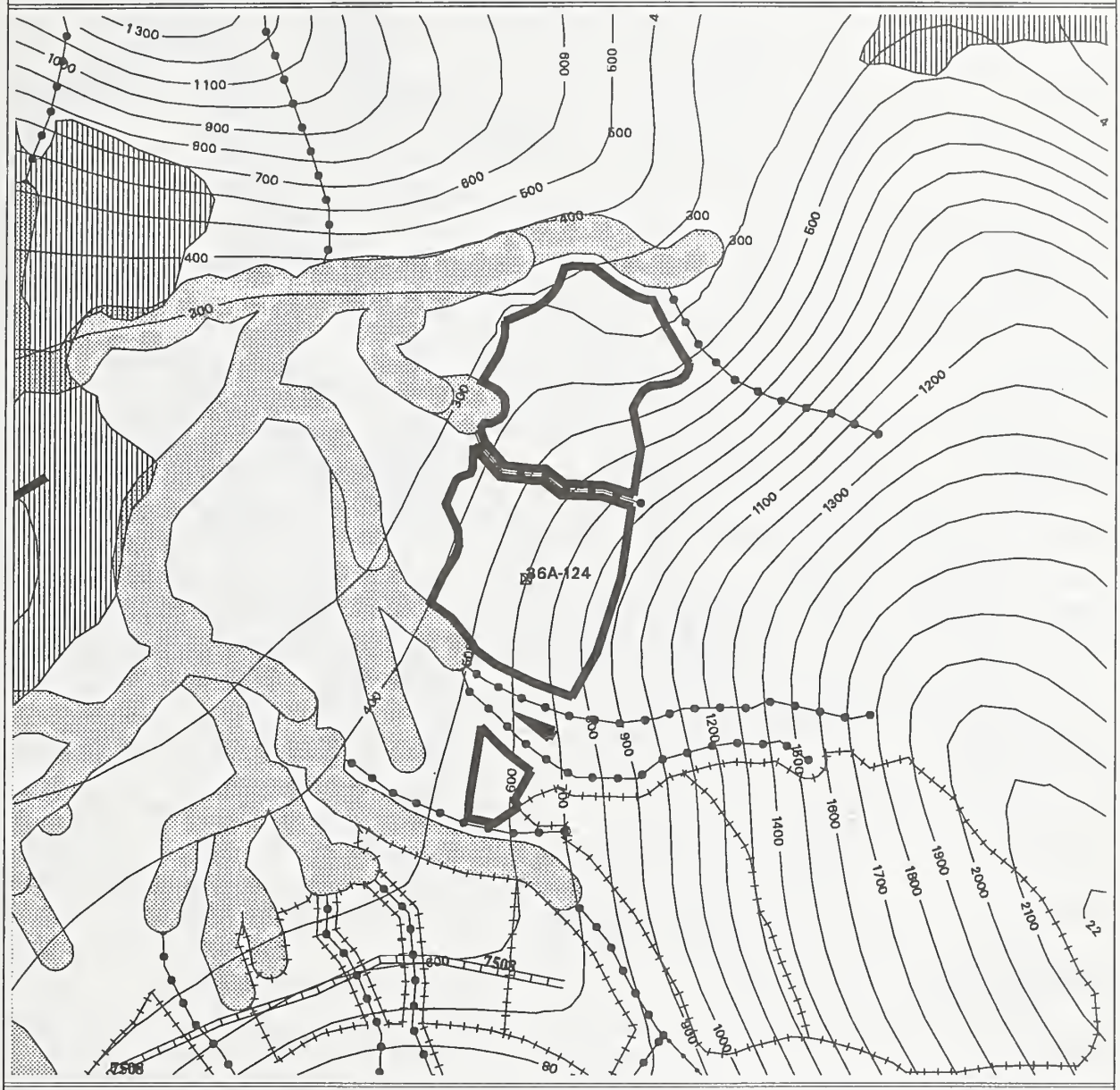
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63820 QUAD(s): SITD4NW

ACRES: 51 Unit 63820 Occurs in Alternatives: B C D F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 04/2051

INDIAN RIVER UNIT CARD

UNIT: 63840 VCU: 2160
ACRES: 28.2 VOLUME (MBF): 814

ALTERNATIVE SUMMARY

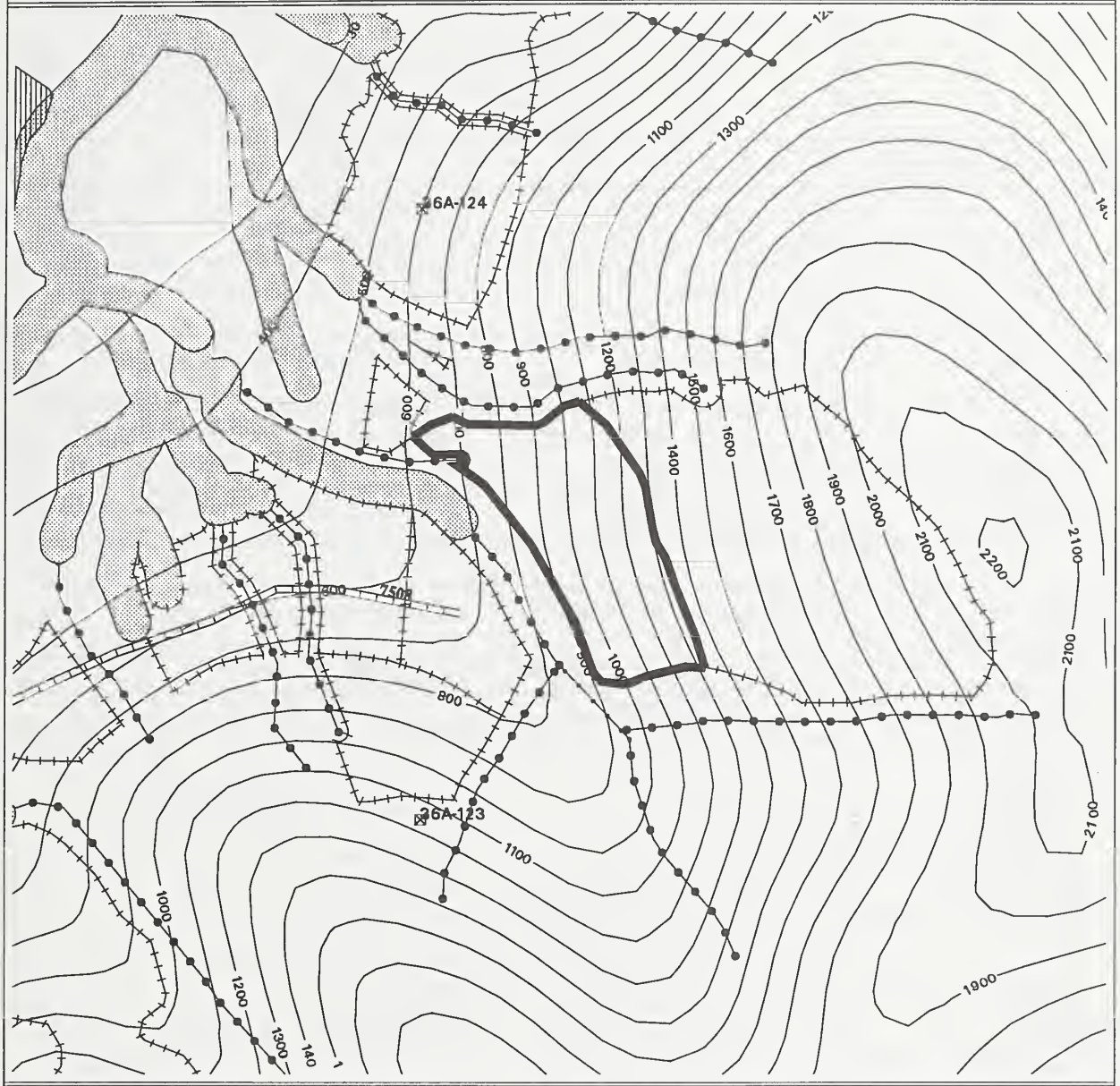
ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	773	Helicopter	Clearcut w/ retention

REVIEW INFORMATION
{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL REMARKS: Low probability habitat for sensitive plants.
{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY REMARKS: No concerns.
{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER REMARKS: Maintain buffers on Class II, Category A stream (along HC3 channel in lower SW corner) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. See hydrology for additional remarks.
{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO REMARKS: Low probability zone
{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER REMARKS: BMP 12.6a; 13.16.
{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL REMARKS: No concerns.
{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER REMARKS: Vulnerability risk = None
{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON REMARKS: Not applicable.
{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL REMARKS: Clearcut.
{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN REMARKS: No concerns.
{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN REMARKS: Clearcut, helicopter harvest.
{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER REMARKS: No concerns.
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG REMARKS: No concerns.
{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63840 QUAD(s): SITD4NW

ACRES: 28 Unit 63840 Occurs in Alternatives: B



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT--HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/98

INDIAN RIVER UNIT CARD

UNIT: 63850 VCU: 2160
ACRES: 38.7 VOLUME (MBF): 985

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	935	Helicopter	Clearcut w/ retention
C	95	935	Helicopter	Clearcut w/ retention
D	95	935	Helicopter	Clearcut w/ retention
E	95	935	Helicopter	Clearcut w/ retention
F	95	935	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to south side Class III stream. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None/Moderate. Report any karst or cave features (springs, disappearing streams, etc.) to Forest Geologist vulnerability assessment.

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut, helicopter harvest.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on south side of unit.

{ **TIMBER** } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

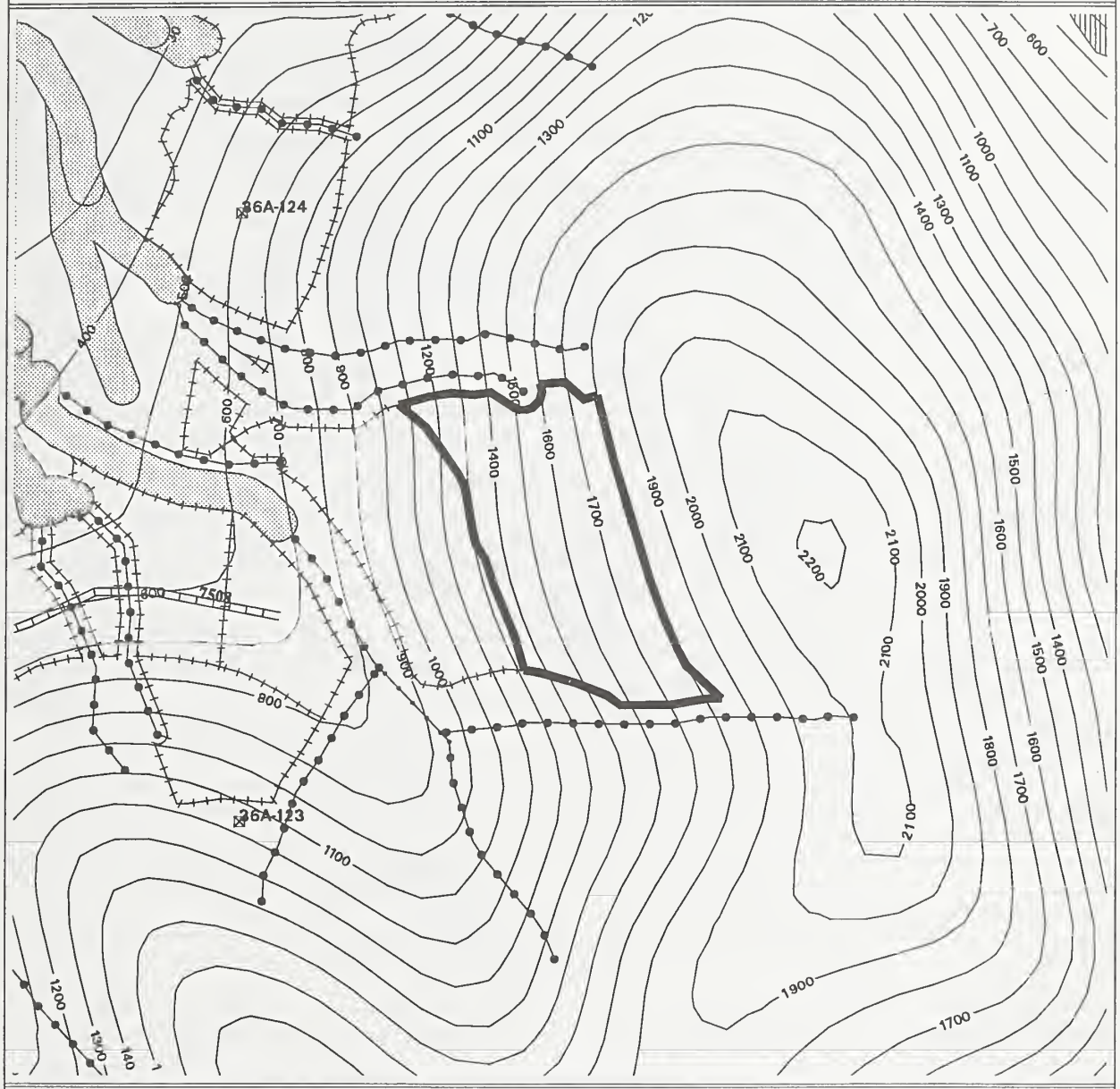
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63850 QUAD(s): SITD4NW

ACRES: 39 Unit 63850 Occurs in Alternatives: B C D E F



Plotted 06/01/98

INDIAN RIVER UNIT CARD

UNIT: 63920 VCU: 2160
ACRES: 14.1 VOLUME (MBF): 257

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	244	Helicopter	Clearcut w/ retention
C	95	244	Helicopter	Clearcut w/ retention
D	95	244	Helicopter	Clearcut w/ retention
E	95	244	Helicopter	Clearcut w/ retention
F	95	244	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III streams (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

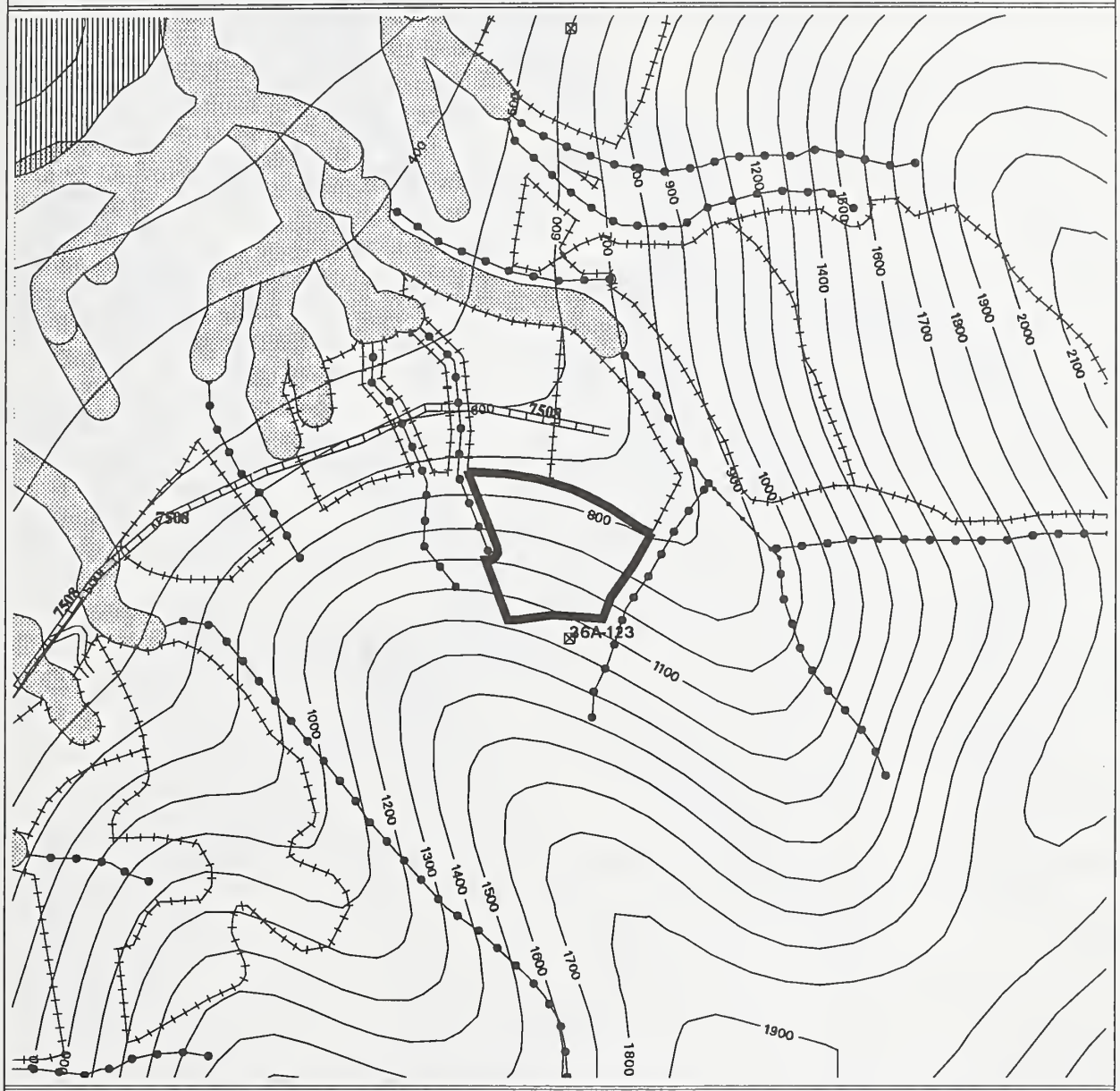
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63920 QUAD(s): SITD4NW

ACRES: 14 Unit 63920 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/98

INDIAN RIVER UNIT CARD

UNIT: 63940 VCU: 2160
ACRES: 9.2 VOLUME (MBF): 141

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	28	Helicopter	Group Selection
E	95	134	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including MM1 channel along SW boundary and FSO channels near the NE boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep unit uphill of wetland-fen area along lower NW boundary (BMP 12.5). Protect Class III, category B segment of FSO channel on NE boundary as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Recommend cable yarding, clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

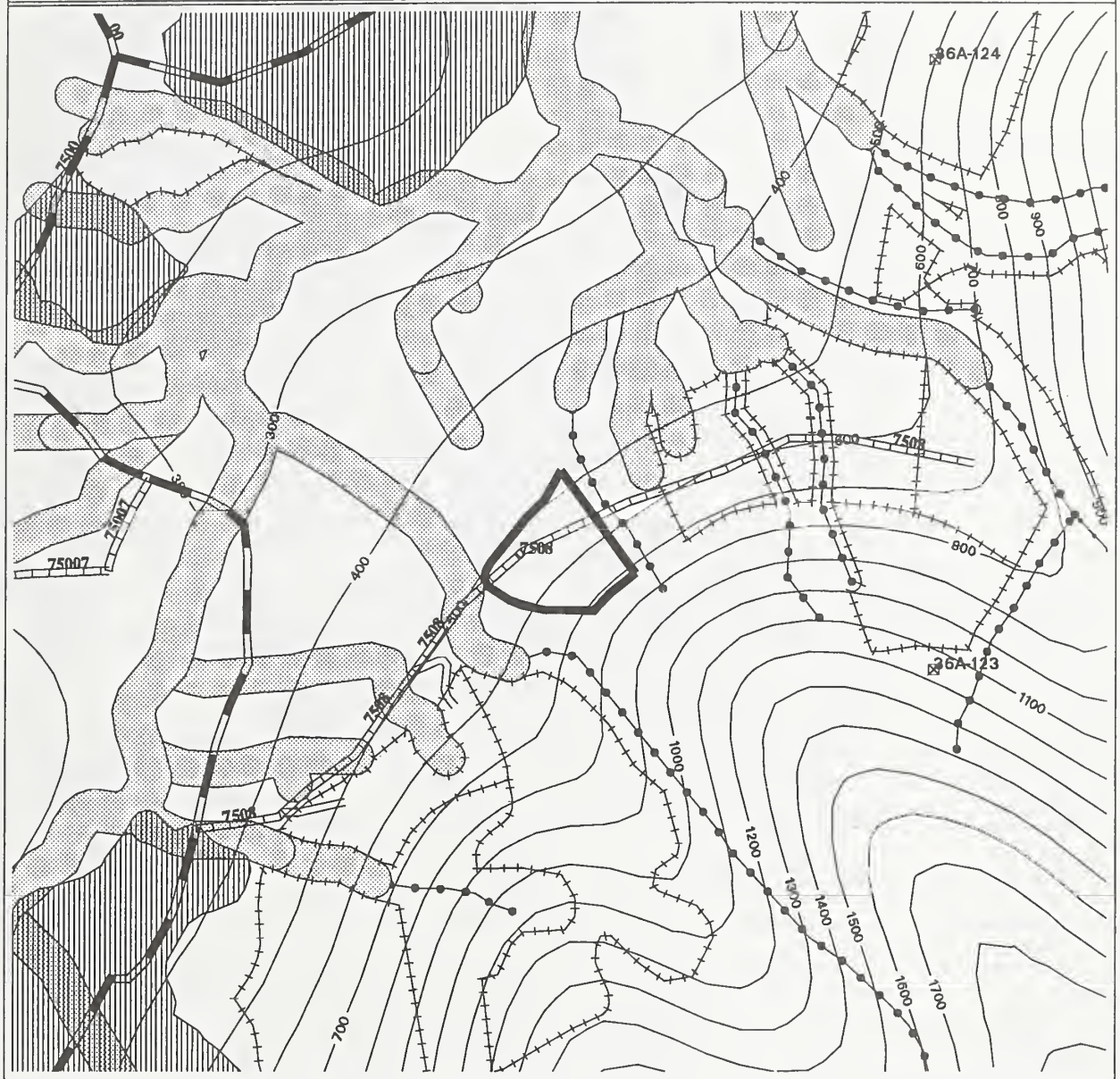
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63940 QUAD(s): SITD4NW

ACRES: 9 Unit 63940 Occurs in Alternatives: B E



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR

Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 63960 VCU: 2160
ACRES: 12.3 VOLUME (MBF): 209

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	42	Helicopter	Group Selection
C	95	198	Cable	Clearcut w/ retention
D	95	198	Cable	Clearcut w/ retention
E	95	198	Cable	Clearcut w/ retention
F	95	198	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including 5 small footslope (FSO) channels along and within the lower N boundary of both blocks. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Keep lower unit boundary uphill of Class II, FSO channels in NW corner. Upstream, where FSO channels become Class III, protect the category B and C streams as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary on north side of central Class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: G.PETERSON, M.REGAN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

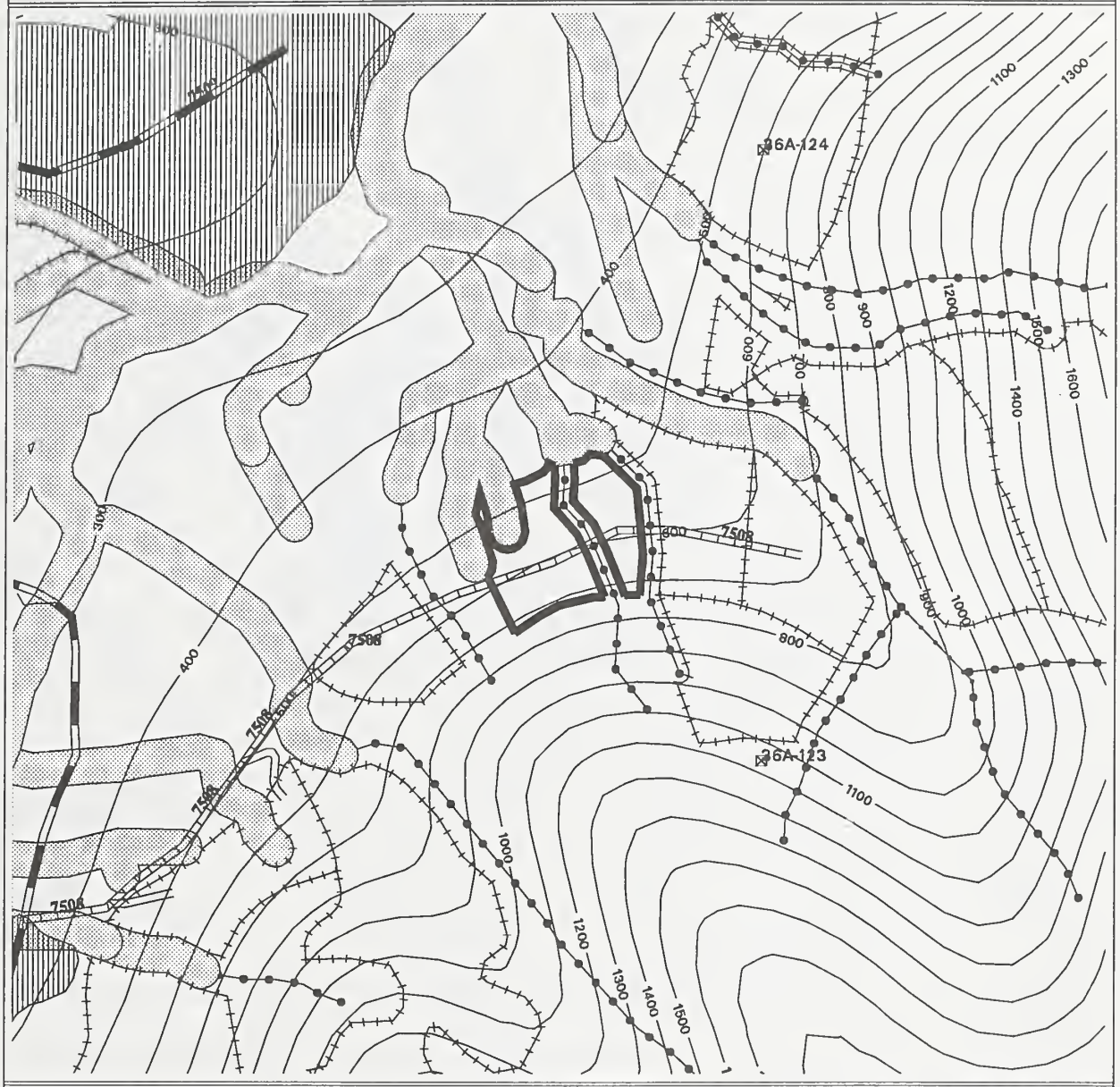
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63960 QUAD(s): SITD4NW

ACRES: 12 Unit 63960 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/2091

INDIAN RIVER UNIT CARD

UNIT: 63970 VCU: 2160
ACRES: 12.7 VOLUME (MBF): 284

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	57	Helicopter	Group Selection
C	95	270	Cable	Clearcut w/ retention
D	95	270	Cable	Clearcut w/ retention
E	95	270	Cable	Clearcut w/ retention
F	95	270	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Maintain buffers on Class II, Category A streams (HC3 channel on N boundary and FSO channels on NW boundary) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along HC3 channel (if harvest >60%). Protect smaller, Class III category B HC0 channel on W boundary as per BMP 13.16 (and 13.3).

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream (west side) (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on west side of unit.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

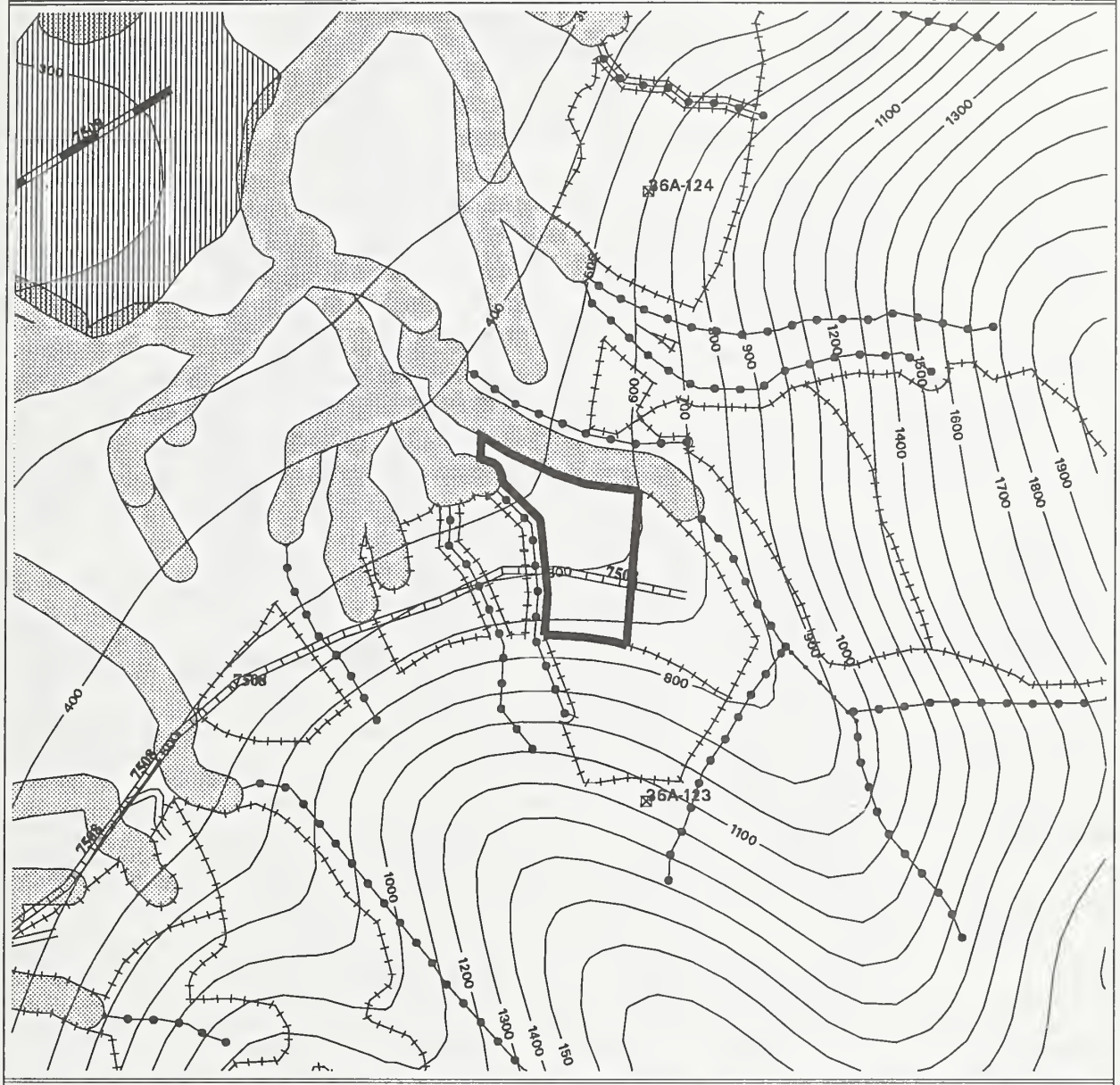
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63970 QUAD(s): SITD4NW

ACRES: 13 Unit 63970 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 63971 VCU: 2160
ACRES: 11.9 VOLUME (MBF): 317

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	20	63	Helicopter	Group Selection
C	95	302	Cable/Helicopter	Clearcut w/ retention
D	95	302	Cable/Helicopter	Clearcut w/ retention
E	95	302	Cable/Helicopter	Clearcut w/ retention
F	95	302	Cable/Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Maintain buffers on Class II, Category A streams (lower NE corner adjacent to HC3 channel) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm, along channel buffer if harvest >60%. Protect Class III segment of category B, HC3 channel as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Specialist needed during layout.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: Clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

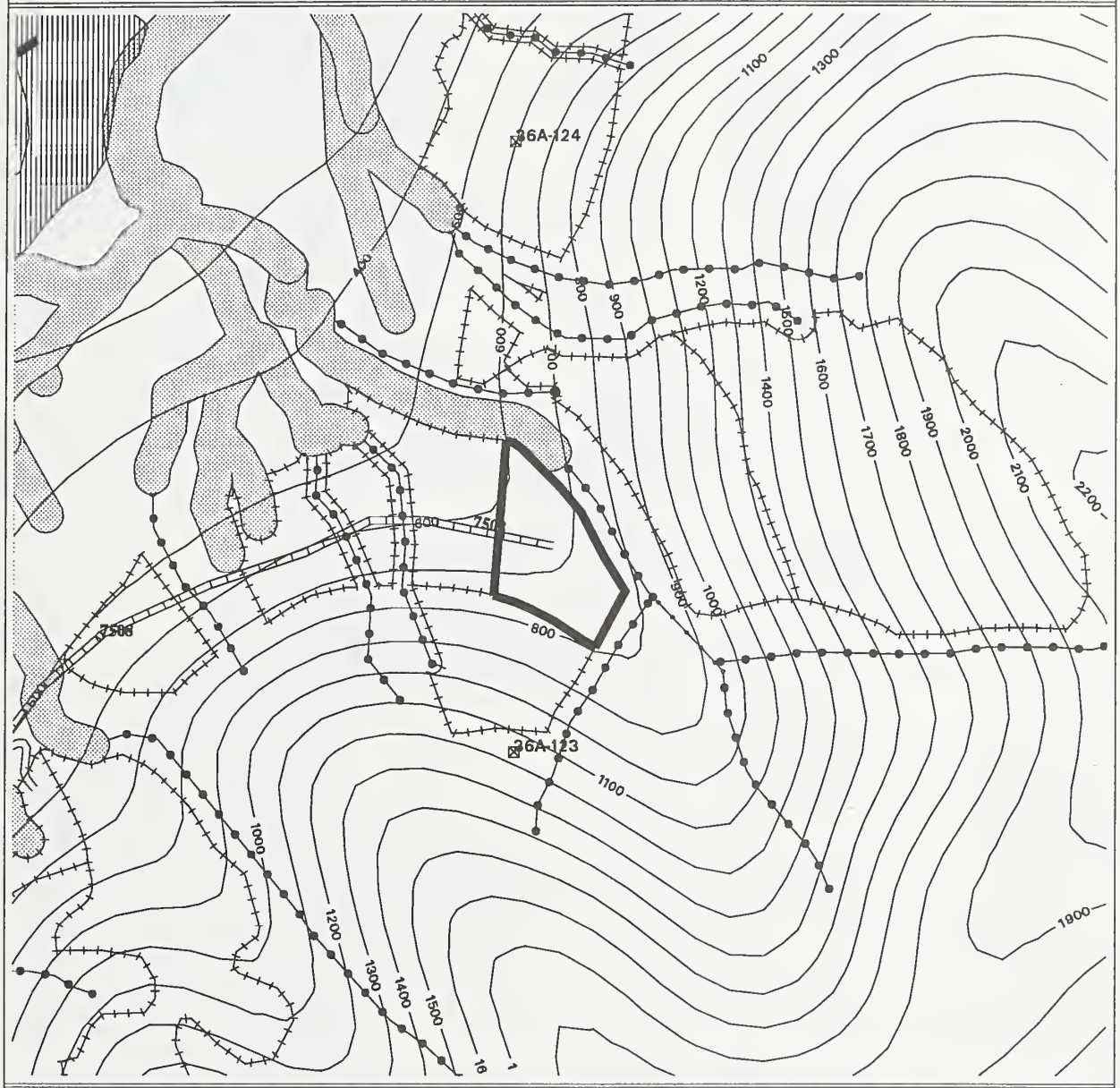
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: L.SHIPLEY APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 63971 QUAD(s): SITD4NW

ACRES: 12 Unit 63971 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/2001

INDIAN RIVER UNIT CARD

UNIT: 64010 VCU: 2160
ACRES: 12.4 VOLUME (MBF): 217

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	206	Helicopter	Clearcut w/ retention
C	95	206	Cable	Clearcut w/ retention
D	95	206	Cable	Clearcut w/ retention
E	95	206	Cable	Clearcut w/ retention
F	95	206	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. Sensitive plants found outside unit in nearby muskegs.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including small footslope (FSO) channels along lower NW boundary and AF1/HC2 channel along S boundary. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Upstream in the unit, the FSO channels are Class IV, category C streams. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class II streams. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: M.REGAN APPROVED BY: M.REGAN
REMARKS: Decadent stand. Cable yarding, clearcut.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

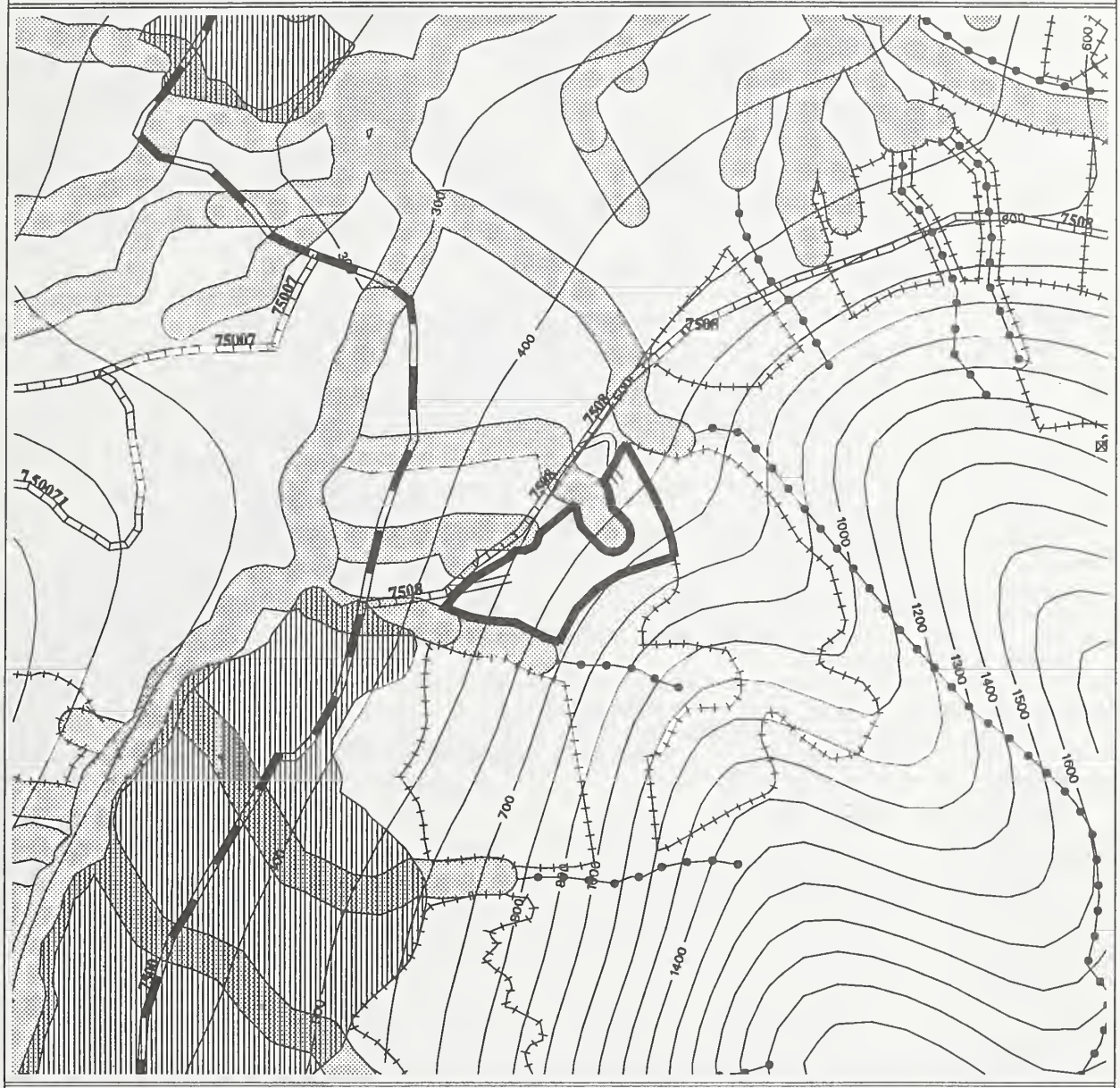
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64010 QUAD(s): SITD4NW

ACRES: 12 Unit 64010 Occurs in Alternatives: B C D E F


7500
7500
7500

INDIAN RIVER UNIT CARD

UNIT: 64020 VCU: 2160
ACRES: 64.5 VOLUME (MBF): 966

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	20	193	Helicopter	Group Selection
D	20	193	Helicopter	Group Selection
E	35	338	Helicopter	Patch Clearcut
F	35	338	Helicopter	Patch Clearcut

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Maintain buffers on Class II, Category A streams (along the HC2 channels on NW and SW boundaries of the most west block, and on the most N corner of the NE block, adjacent to the MM1 channel) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams (Class II).

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 12.6a.

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Recommend group selection for 20% of volume due to numerous V-notches and highly dissected ground.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON, M.REGAN APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

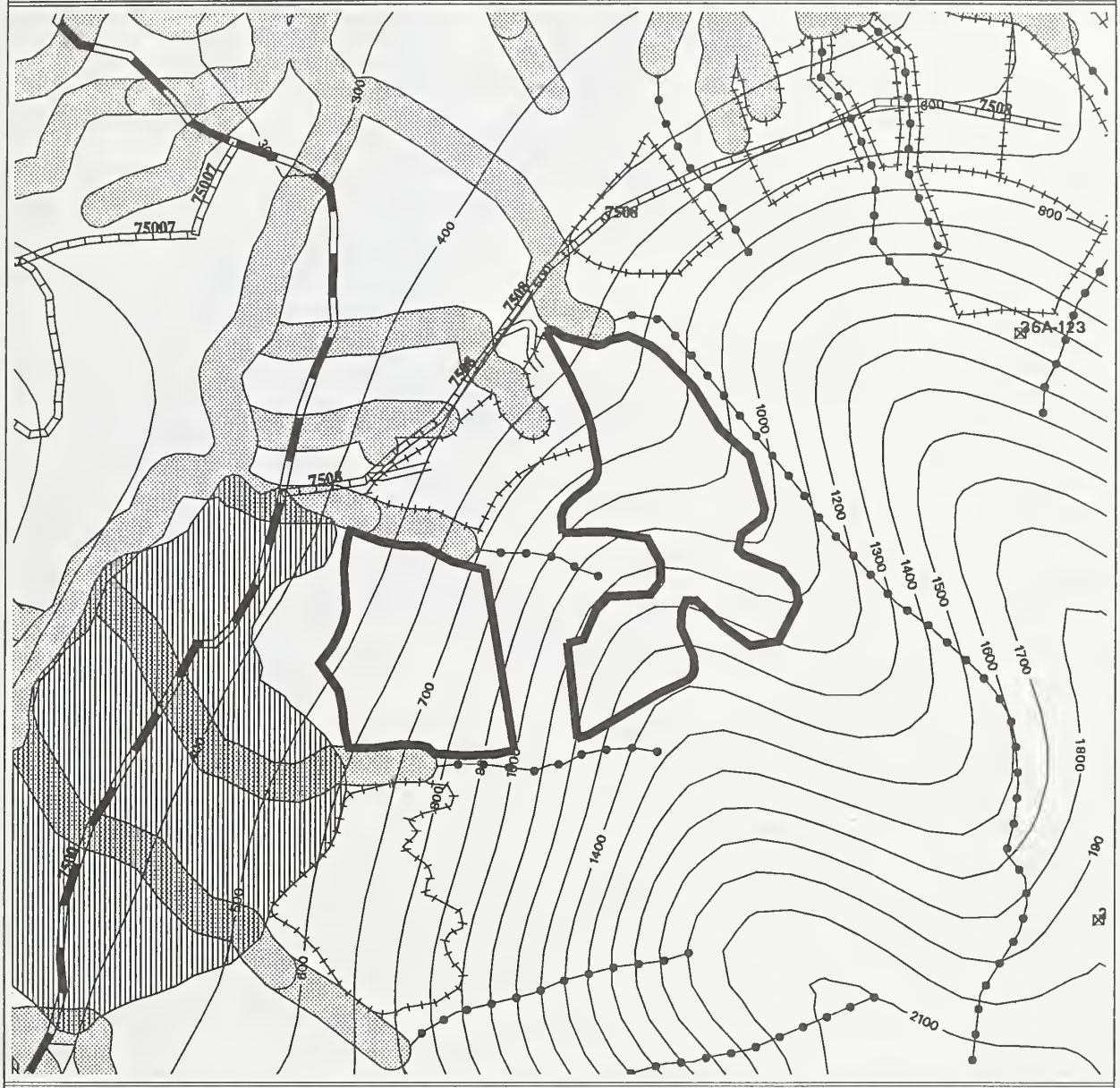
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Group selections will help maintain suitable old-growth characteristics. Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64020 QUAD(s): SITD4NW

ACRES: 64 Unit 64020 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

INDIAN RIVER UNIT CARD

UNIT: 64110 VCU: 2160
ACRES: 20.9 VOLUME (MBF): 321

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	6/299	Helicopter	Clearcut w/ retention
C	90/95	6/299	Helicopter	Clearcut w/ retention
D	90/95	6/299	Helicopter	Clearcut w/ retention
E	90/95	6/299	Helicopter	Clearcut w/ retention
F	90/95	6/299	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: Maintain buffers on Class II, Category A streams (HC2 and HC3/AF1 channels along N and SW boundaries) as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Leave windfirm boundary; place unit boundary at or above slope break of Class III channels (2/3 rule). [Note: "2/3 rule" = cut all trees having less than 2/3 of their height lying below the channel slope break.]

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to south side Class II and Class III. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: S.GODFREY APPROVED BY: M.REGAN
REMARKS: Clearcut, helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

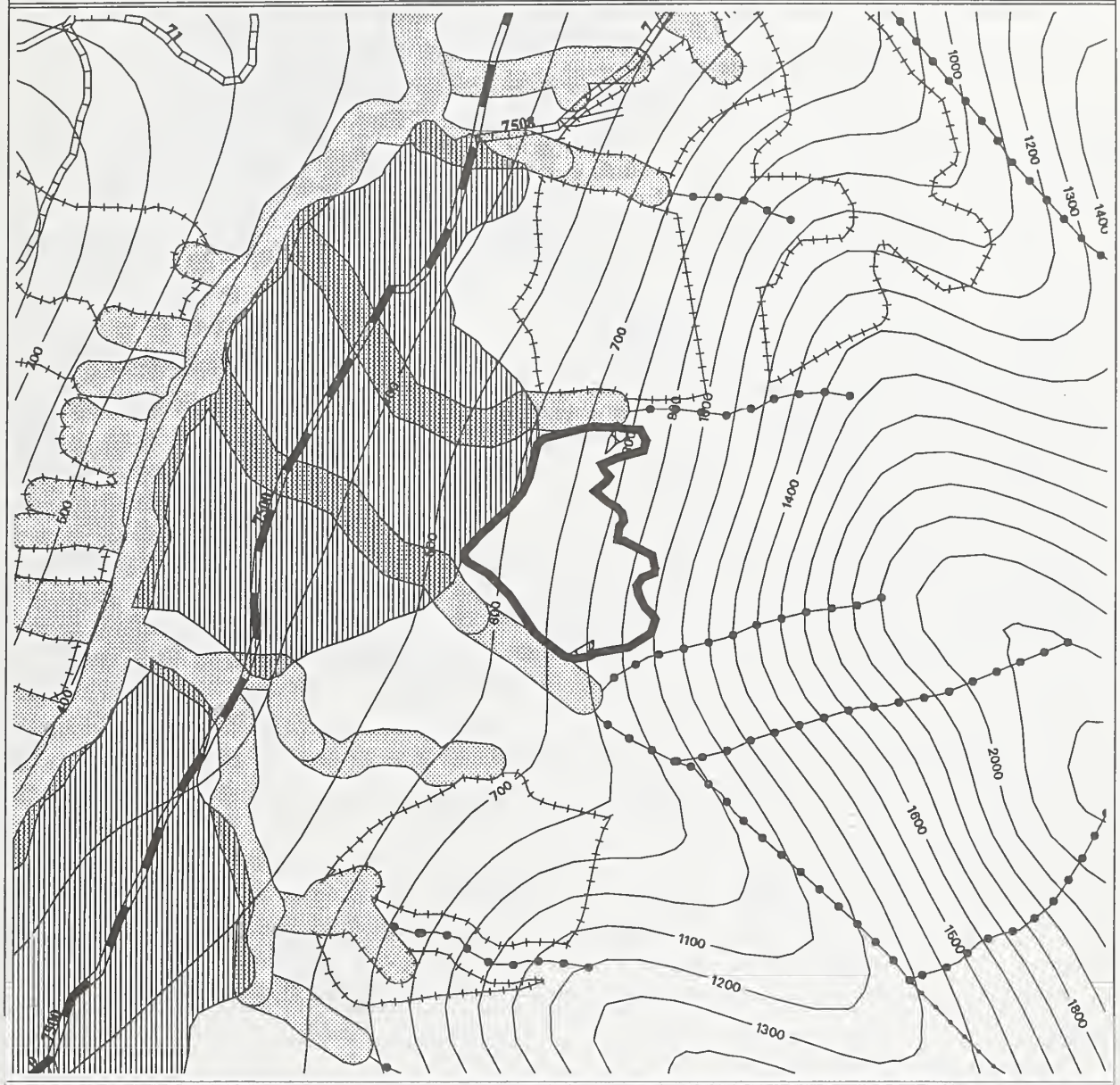
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64110 QUAD(s): SITD4NW

ACRES: 21 Unit 64110 Occurs in Alternatives: B C D E F



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 64210 VCU: 2160
ACRES: 28.3 VOLUME (MBF): 488

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	390	Helicopter	Overstory Removal
C	80	390	Helicopter	Overstory Removal
D	80	390	Helicopter	Overstory Removal
E	80	390	Helicopter	Overstory Removal
F	80	390	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Open forest/muskeg habitat. Low survey priority.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams along lower NW, W, and S boundaries of unit. Maintain buffers on Class II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. These include 3 FSO channels, and an HC3 channel. Upstream within and alongside unit, the FSO/HC6 channels are Class III or IV. The HC6 channel that splits the unit and the FSO channel on the N boundary are category B streams. Protect as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm leave strip to center Class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Overstory removal, >16 inches DBH.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Create windfirm leave strip along Class III channel within unit.

{ TIMBER } FIELD REVIEW: B.BEALL APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64210 QUAD(s): SITD4NW

ACRES: 28 Unit 64210 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 64410 VCU: 2160
ACRES: 23.4 VOLUME (MBF): 425

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	404	Cable	Clearcut w/ retention
C	95	404	Cable	Clearcut w/ retention
D	95	404	Cable	Clearcut w/ retention
E	95	404	Cable	Clearcut w/ retention
F	95	404	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants. Sensitive plants found on temporary road to unit. Botanist present during layout for road.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See soils and hydrology for remarks.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm buffer on south side Class III stream. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary along Class III channel on south side of unit.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Cable system.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

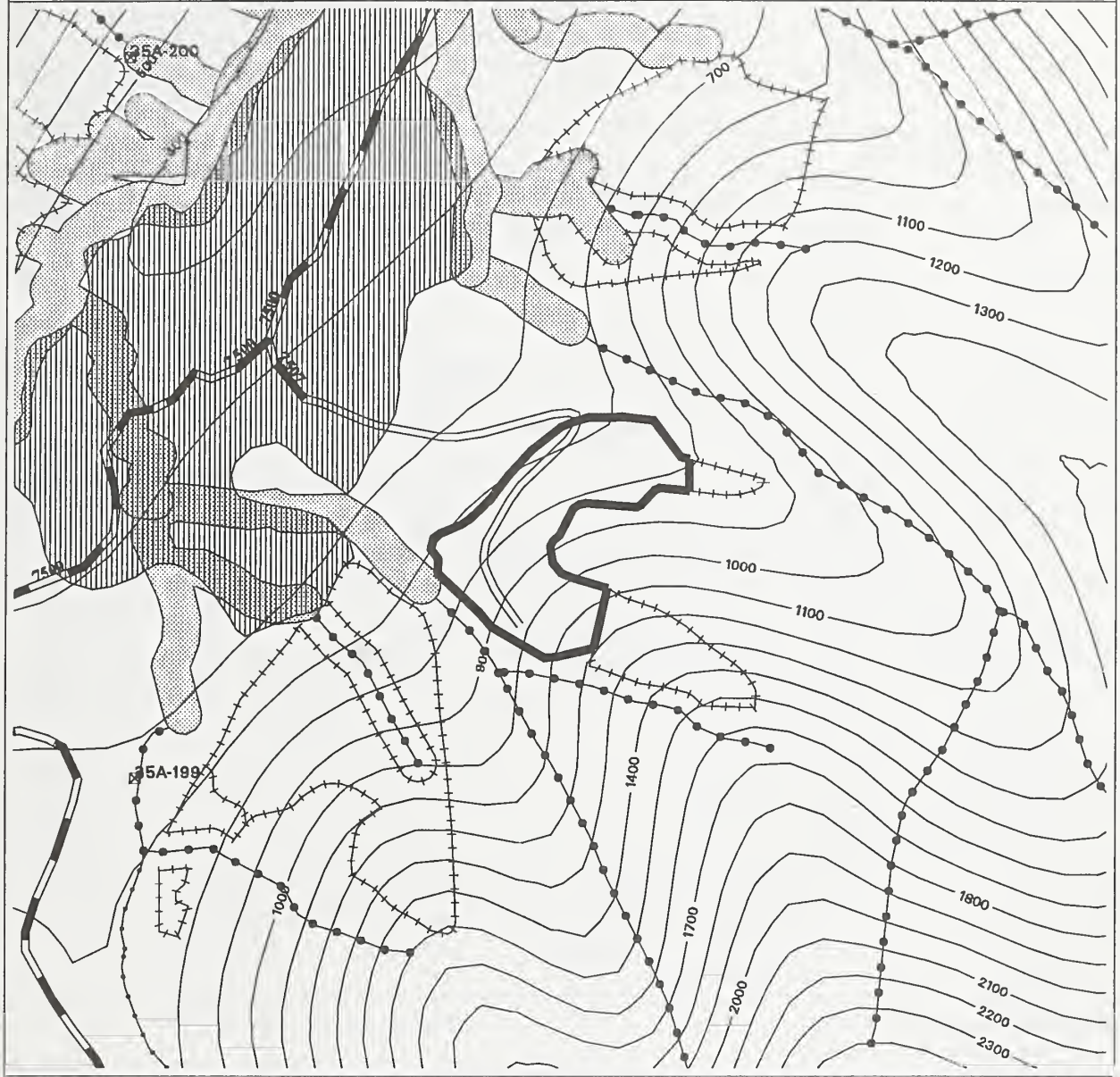
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64410 QUAD(s): SITD4NW

ACRES: 23 Unit 64410 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/91

INDIAN RIVER UNIT CARD

UNIT: 64420 VCU: 2160
ACRES: 9.4 VOLUME (MBF): 172

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	95	164	Helicopter	Clearcut w/ retention
C	95	164	Helicopter	Clearcut w/ retention
D	95	164	Helicopter	Clearcut w/ retention
E	95	164	Helicopter	Clearcut w/ retention
F	95	164	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ **FISHERIES** } FIELD REVIEW: NONE APPROVED BY: G.KILLINGER
REMARKS: See hydrology and soils for remarks.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary to Class III stream. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Helicopter harvest.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Leave windfirm boundary on Class III channel on south side of unit.

{ **TIMBER** } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

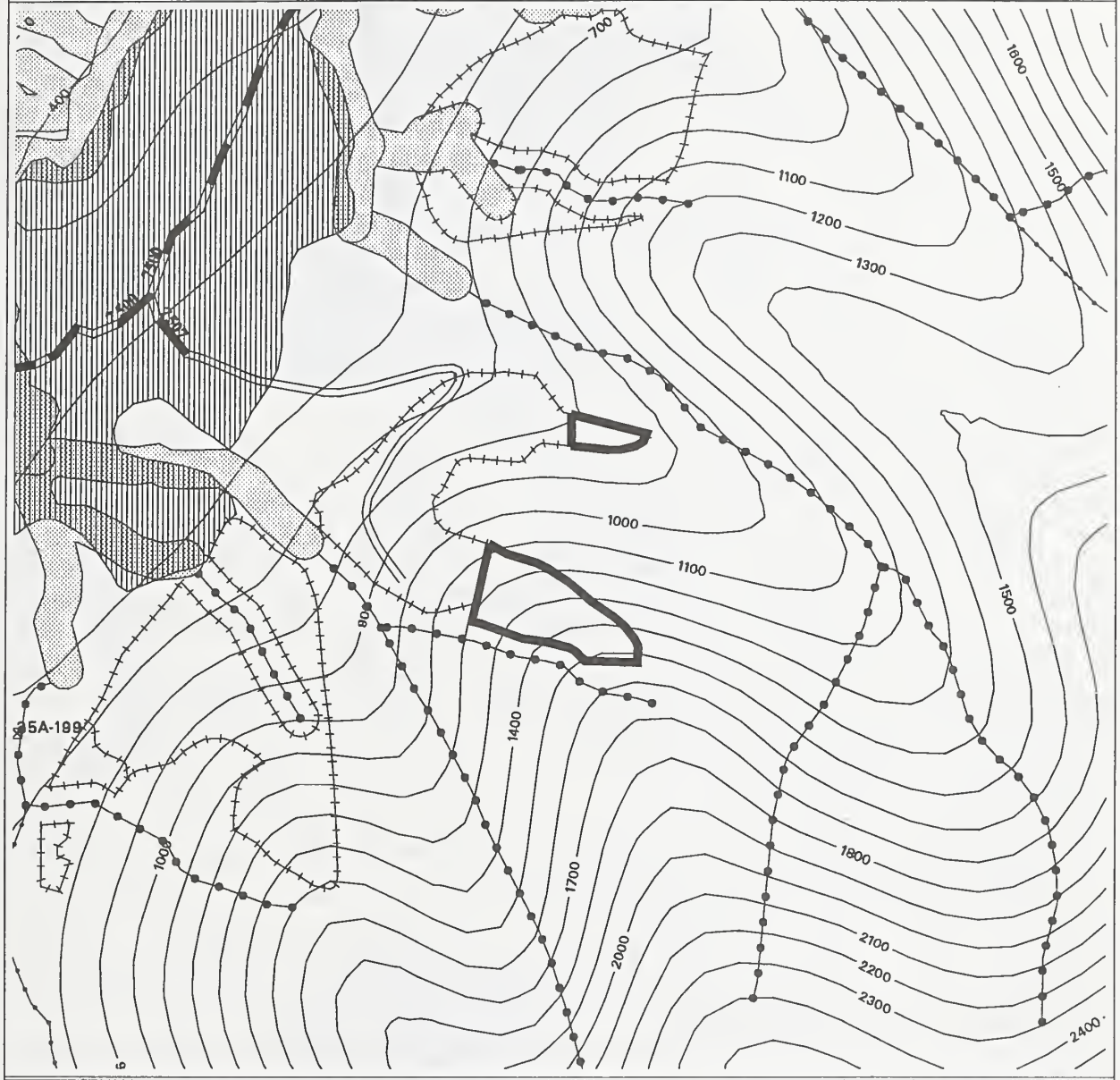
{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64420 QUAD(s): SITD4NW

ACRES: 9 Unit 64420 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 6/2/2021

INDIAN RIVER UNIT CARD

UNIT: 64510 VCU: 2160
ACRES: 32.8 VOLUME (MBF): 596

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	80	477	Helicopter	Overstory Removal
C	80	477	Helicopter	Overstory Removal
D	80	477	Helicopter	Overstory Removal
E	80	477	Helicopter	Overstory Removal
F	80	477	Helicopter	Overstory Removal

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Protect HC6, Class III, category B channels along boundaries and within unit, as per BMP 13.16 (and 13.3).

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm leave strip to center Class III stream (feathering). BMP 12.6a; 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Overstory removal, >16 inches DBH.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: Helicopter harvest.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

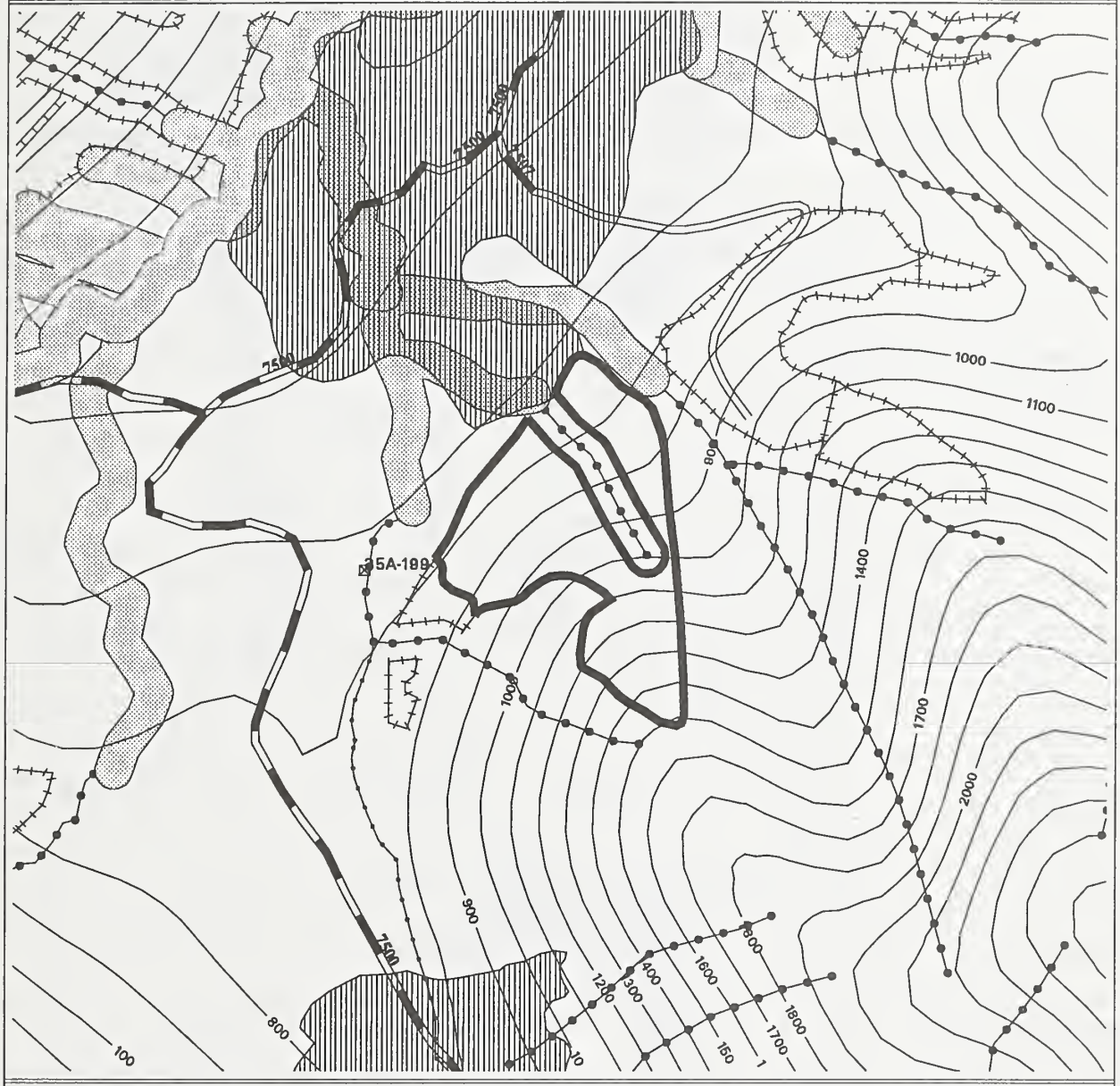
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64510 QUAD(s): SITD4NW

ACRES: 33 Unit 64510 Occurs in Alternatives: B C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 05/20/91

INDIAN RIVER UNIT CARD

UNIT: 64530 VCU: 2160
ACRES: 3.3 VOLUME (MBF): 56

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
B	90/95	6/45	Helicopter	Clearcut w/ retention
C	90/95	6/45	Helicopter	Clearcut w/ retention
D	90/95	6/45	Helicopter	Clearcut w/ retention
E	90/95	6/45	Helicopter	Clearcut w/ retention
F	90/95	6/45	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: No concerns.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: No concerns.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: NONE APPROVED BY: D.KELLIHER
REMARKS: BMP 13.16.

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: No concerns.

{ SOILS } FIELD REVIEW: J.WINN APPROVED BY: J.WINN
REMARKS: No concerns.

{ TIMBER } FIELD REVIEW: L.WINN APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

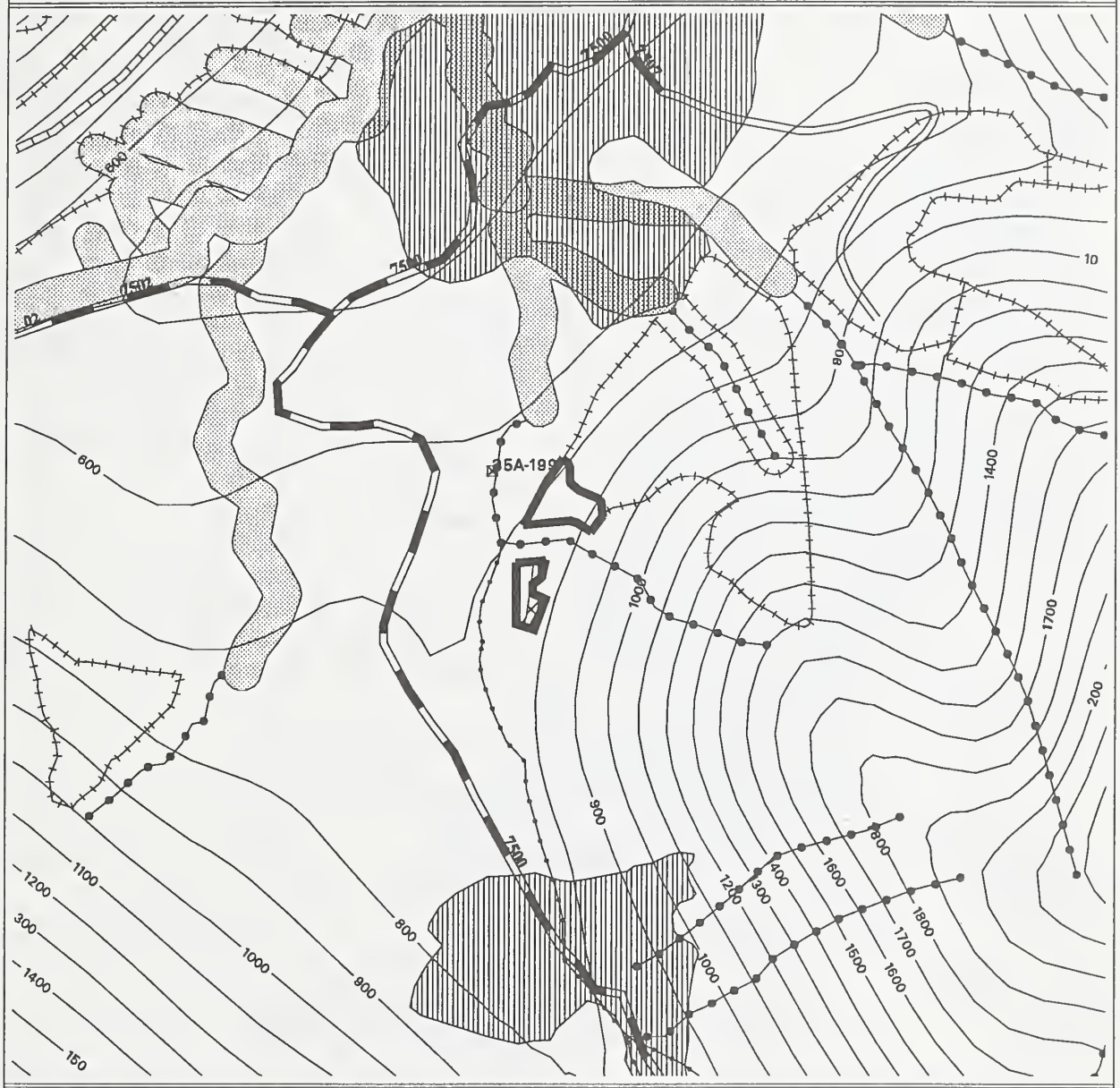
{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: NONE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 64530 QUAD(s): SITD4NW

ACRES: 3 Unit 64530 Occurs in Alternatives: B C D E F



·100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 04/20/01

INDIAN RIVER UNIT CARD

UNIT: 65013 VCU: 2160
ACRES: 12.7 VOLUME (MBF): 255

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90/95	159/91	Helicopter	Clearcut w/ retention
D	90/95	159/91	Helicopter	Clearcut w/ retention
E	90/95	159/91	Helicopter	Clearcut w/ retention
F	90/95	159/91	Helicopter	Clearcut w/ retention

REVIEW INFORMATION

{ **BOTANY** } FIELD REVIEW: NONE APPROVED BY: S.TRULL
REMARKS: Low probability habitat for sensitive plants.

{ **ECOLOGY** } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain old-growth characteristics.

{ **FISHERIES** } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify/flag boundaries of Class I and II, category A fish streams, including upstream end of Class II habitat on smaller footslope (FSO) channels on either side of smaller N block, and on larger HC2/HC6 channels on either side of the larger S block. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. HC2/HC6 channels that extend uphill on either side of larger SW block are Class III category B streams. Protect as per BMP 13.16 (and 13.3). Leave windfirm boundary.

{ **HERITAGE** } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ **HYDROLOGY** } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm buffer to Class III streams. (BMP 12.6a; 13.16).

{ **LANDS** } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ **MINERALS/KARST** } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ **RECREATION** } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ **SILVICULTURE** } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ **SOILS** } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: No concerns.

{ **TIMBER** } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ **TRANSPORTATION** } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ **VISUAL** } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ **WILDLIFE** } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 65013 QUAD(s): SITD4NW

ACRES: 13 Unit 65013 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



INDIAN RIVER UNIT CARD

UNIT: 65020 VCU: 2160
ACRES: 62.8 VOLUME (MBF): 1072

ALTERNATIVE SUMMARY

ALTER-NATIVE	PERCENT HARVEST	HARVEST VOLUME	HARVEST METHOD	HARVEST SYSTEM
C	90/95	456/630	Cable	Clearcut w/ retention
D	90/95	456/630	Cable	Clearcut w/ retention
E	90/95	456/630	Cable	Clearcut w/ retention
F	90/95	456/630	Cable	Clearcut w/ retention

REVIEW INFORMATION

{ BOTANY } FIELD REVIEW: M.SHEPHARD APPROVED BY: S.TRULL
REMARKS: Alpine/subalpine habitat. No sensitive plants found in survey.

{ ECOLOGY } FIELD REVIEW: YES APPROVED BY: T.GARVEY
REMARKS: Maintain adequate wildlife travel corridors.

{ FISHERIES } FIELD REVIEW: G.KILLINGER APPROVED BY: G.KILLINGER
REMARKS: Specialists needed during layout to identify and flag boundaries of Class I and II, category A fish streams, including upstream end of Class II habitat on 8 FSO channels all along the lower SE boundary. Maintain buffers on Class I and II, Category A streams as specified in TLMP Riparian S&Gs (RIP2, III, E & F), and per BMP 12.6a. Feather (remove larger trees, retain nonmerchantable trees) adjacent to stream buffer to increase probability that it will remain windfirm. Keep lower SW unit boundary uphill of Class II channels where possible to increase windfirmness of stream buffers. FSO channels that extend uphill of Class II habitat are mostly Class IV, category C streams. Protect as per BMP 13.16, 13.3.

{ HERITAGE } FIELD REVIEW: NONE NEEDED APPROVED BY: K.IWAMOTO
REMARKS: Low probability zone

{ HYDROLOGY } FIELD REVIEW: D.KELLIHER APPROVED BY: D.KELLIHER
REMARKS: Windfirm boundary on south side v-notch. (BMP 12.6a; 13.16).

{ LANDS } FIELD REVIEW: NONE NEEDED APPROVED BY: J.MORRELL
REMARKS: No concerns.

{ MINERALS/KARST } FIELD REVIEW: HARZA NW, Inc. APPROVED BY: R.BAER
REMARKS: Vulnerability risk = None

{ RECREATION } FIELD REVIEW: YES APPROVED BY: M.NELSON
REMARKS: Not applicable.

{ SILVICULTURE } FIELD REVIEW: S.BEALL APPROVED BY: S.BEALL
REMARKS: Clearcut with retention.

{ SOILS } FIELD REVIEW: NONE APPROVED BY: J.WINN
REMARKS: Specialist needed during layout. Leave windfirm boundary on Class III channel on south side of unit.

{ TIMBER } FIELD REVIEW: G.PETERSON APPROVED BY: M.REGAN
REMARKS: No concerns.

{ TRANSPORTATION } FIELD REVIEW: APPROVED BY: B.CRIDER
REMARKS: No concerns.

{ VISUAL } FIELD REVIEW: NONE APPROVED BY: B.HAMBERG
REMARKS: No concerns.

{ WILDLIFE } FIELD REVIEW: K.RUTLEDGE APPROVED BY: L.SHIPLEY
REMARKS: Buffers and unharvested areas provide suitable travel corridors. When using clearcut w/retention harvest system, implement W/L marten S&G XVI.A.2.c). Implement W/L 200 year or greater rotation length S&G IV.C. (Modified 1997 TLMP).

INDIAN RIVER PROJECT HARVEST UNIT CARD
PLANNED HARVEST UNIT MAP

VCU: 2160 UNIT NUMBER: 65020 QUAD(s): SITD4NW

ACRES: 63 Unit 65020 Occurs in Alternatives: C D E F



100 FT CONTOUR INTERVAL

0 0.19 0.38 Miles

MAPSCALE 1:12000

UNIT BOUNDARY

ADJACENT UNIT

NEW SPEC. ROAD 1700

TEMPORARY ROAD

EXISTING SPEC. ROAD 1700

CLASS II STREAM

CLASS III STREAM

PHOTO POINT

EAGLE TREE

EXISTING CLEARCUTS

MARTEN HABITAT–HIGH VALUE

SALTWATER AND LAKES

CLASS I & II STREAM BUFFER

AREA LOCATOR



Plotted 06/20/01

Appendix K

LTF Siting Guidelines and Dive Reports

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*
SITING GUIDELINES
1. Proximity to Rearing and Spawning Areas: Siting of log transfer and log raft storage facilities within 300 feet of the mouths of anadromous fish streams, or in areas known to be important for fish spawning or rearing, is normally prohibited.
2. Protected Locations: Log transfer and log raft storage facilities should be sited in weather-protected waters with bottoms suitable for anchoring and with at least 20 acres for temporary log storage and log booming.
3. Upland Facility Requirements: Log transfer facilities generally should be sited in proximity to at least five acres of relatively flat uplands. There should also be a body of water sufficient to provide a minimum of 60 lineal feet of facility face.
4. Safe Access to a Facility from the Uplands: To provide safe access to the log transfer facility and adjoining log sort yard, the facility should be sited where access roads to the facility can maintain a grade of 10% or less for trucks and 4% for specialized equipment.
5. Bark Dispersal: Log transfer facilities should be sited along or adjacent to straits and channels or deep bays where currents may be strong enough to disperse sunken or floating wood debris. Siting log transfer facilities in embayments with sills or other natural restrictions to tidal exchange should be avoided.
6. Site Productivity: Sites for in-water storage and/or transfer of logs should be located in areas having the least productive intertidal and subtidal zones.
7. Sensitive Habitat: Log transfer facilities and log raft storage areas should not be sited on or adjacent to (i.e., near enough to affect) extensive tideflats, salt marshes, kelp or eelgrass beds, seaweed harvest areas or shellfish concentration areas.
8. Safe Marine Access to Facilities: Log rafting and storage facilities should be safely accessible to tug boats with log rafts at most tides and on most winter days.
9. Storage and Rafting: Logs, log bundles, and log rafts should be stored in areas where they will not ground at low tide. A minimum depth of 40 feet or deeper measures at mean lower low water (mllw) for log raft storage is preferred.
10. Avoid Bald Eagle Nest Trees: Site log transfer facilities to avoid bald eagle nests. No project construction or operations should be closer than 330 feet to any bald eagle nest tree.
* Guidelines prepared by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee (1985).

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*

CONSTRUCTION AND OPERATION GUIDELINES

1. Log Transfer Facility Design: Log transfer facility design should be the least environmentally damaging, practicable alternative. Factors to be considered in selection of design alternatives include: 1) economic practicality; 2) facility requirements; 3) physical site constraints; 4) timber volumes to be transferred (site usage and duration); 5) total potential effects on biota and water quality (including biological productivity and sensitivity); and 6) other potential uses of the site and facility.

2. Fill Structures: Fill structures shall be designed and constructed to prevent erosion, pollution and structural displacement.

3. Timing of Inwater Construction: Inwater construction, blasting, and filling associated with LTF sites should be timed to limit adverse impacts to marine and estuarine fishery resources and avoid conflicts with other user groups.

4. Bark Accumulation Management: The siting, design, and operation of the LTF and contiguous collateral upland facilities shall utilize best practicable procedures and methodologies to control intertidal and submarine accumulations of bark.

5. Solid Waste Management: Solid waste, including wood and other solid waste generated from the LTF, contiguous facilities and other collateral facilities shall be routinely removed from the log transfer facilities and adjacent facilities and disposed of at an approved upland sold waste disposal site.

6. Bark Accumulation: The regulatory agency(ies) will impose an interim intertidal and submarine threshold bark accumulation level. When accumulations exceed the threshold level, cleanup - if any - will occur at the discretion of the permitting agency(ies). The interim threshold bark accumulation level is described as 100% coverage exceeding both 1 acre in size and a thickness greater than 10 cm (3.9 inches) at any point.

7. Bundle Speed: The speed of log bundles entering receiving waters should be the slowest practicable speed achievable. Decisions on the allowable transfer system that can be used will occur on a site-specific basis during the permitting process.

8. Surface Drainage Management: The design, construction, and operation of LTFs, contiguous sort yards, and log storage yards shall utilize practicable procedures for control of surface water runoff from facilities.

9. Control of Hydrocarbons: The log transfer system and adjacent sort yard handling equipment shall be operated and maintained to minimize petroleum and lubricating products from entering waters.

10. Onshore Log Storage: Where feasible, preference must be given to onshore storage and barging of logs.

11. Facility Maintenance and Reclamation: The permittee shall maintain the structure or work authorized in good condition and in reasonable accordance with the approved plans and drawings. If and when the permittee desires to abandon the authorized activity herein, unless such abandonment is part of a transfer procedure by which the permittee is transferring its interests to a third party, the permittee must restore the area to a satisfactory condition.

* Guidelines prepared by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee (1985).

LTF SITING, CONSTRUCTION AND OPERATION , AND MONITORING AND REPORTING GUIDELINES*

MONITORING AND REPORTING GUIDELINES

1. Monitoring by Permittee: Monitoring for bark accumulations, oil sheen, and surface runoff associated with the operation of log transfer facilities is the responsibility of the permittee. The regulatory agencies may, at their discretion, be responsible for some or all monitoring requirements.

2. Monitoring Requirements: Monitoring should be undertaken at all continuous- and intermittent-use LTF sites, and at those occasional- and incidental-use LTFs at which total volume of logs transferred is similar to that of intermittent-use sites. The level of monitoring and parameters to be monitored should be determined on a site-specific basis. Monitoring at occasional- and incidental-use facilities may be required on a site specific basis. The need for monitoring of occasional- or incidental-use sites will be limited. Permittees will be required to submit a monitoring program to the permitting agencies prior to operation of a new continuous- or intermittent-use LTF. Agency approval of monitoring plans is required. Requirements for monitoring should be responsive to data obtained during prior monitoring activities.

3. Annual Monitoring for Bark Accumulation: At continuous- and intermittent-use LTFs, monitoring of bark debris accumulation should occur prior to the operating season as a minimum requirement. Monitoring at intermittent LTFs would occur only during those periods when the LTF is active.

4. Elements of Bark Accumulation Monitoring Program: Elements that should be included in a monitoring program for continuous- and intermittent-use LTFs are site-specific and may include but not be limited to:
   a. permanent transects
   b. measurements of areal extent, thickness and percent coverage of bark debris
   c. measurements (a) and (b) are from mean high water to depths of 60 feet mllw.

5. Monitoring for Oil Sheen: Waters in the vicinity of an LTF shall be monitored during operations for the presence of a visible sheen and the presence of sheens shall be recorded when observed.

6. Monitoring Upland Discharges: On a case-by-case basis, discharges of rainfall runoff from the log sorting and storage yard and discharges from any settling pond used to treat water may require monitoring to ensure compliance with State Water Quality Standards and the Clean Water Act.

7. Reporting Guidelines: Routine annual reports include the following descriptive information:
   a. Location of LTF (402/404 permits require latitude and longitude; Forest Service traditionally uses legal descriptions).
   b. Description of LTF, including transfer devices and sorting and storage areas.
   c. Permit holder and/or operator of LTF.
   d. Starting and ending dates of operating season (from first to last bundle), and number of operating days per season.
   e. Gross volume in board feet (Scribner Scale) or number of bundles transferred during the operating season.
   f. Monitoring data described in the monitoring guidelines.

* Guidelines prepared by the Alaska Timber Task Force Log Transfer Facility Guidelines Technical Subcommittee (1985).

SUNNY COVE
BARK DEPTH SURVEY
PERFORMED BY BOB BOES
7/21/96

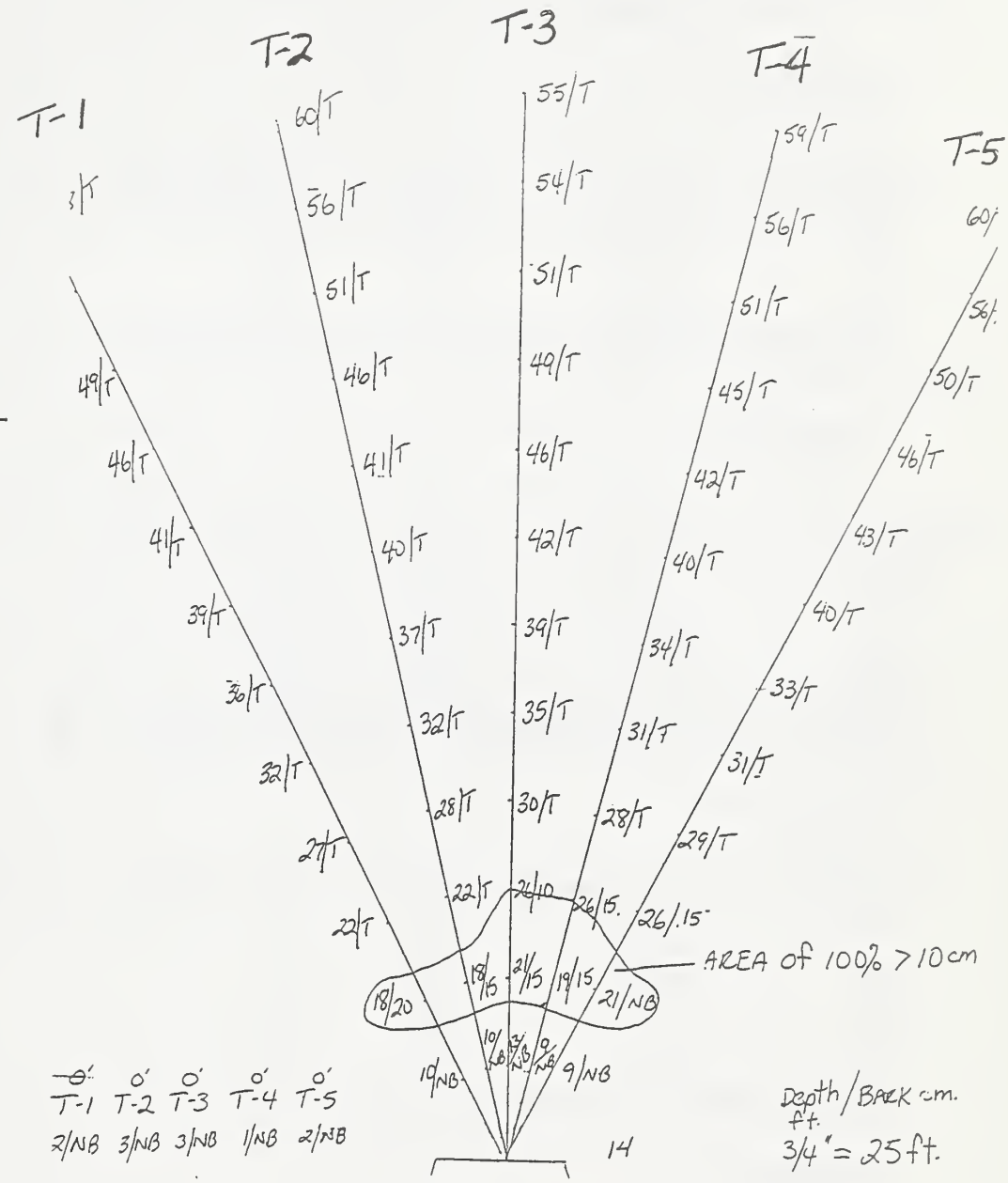
SUNNY COVE
INTRODUCTION

Sunny Cove was requested by the USFS. The job was performed by Bob Boes on 7/21/96. Bob is a marine biologist who has done many bark depth studies for the Forest Service in the recent past.

A 1/2 inch aluminum rod, marked in centimeters, was used to take the measurements. Five transects, radiating from a permanent central point, were used as reference lines. Measurements were taken every 25 feet. Transects were 300 feet long or to a depth that exceeded 60 feet. A hole was dug in several places along each transect to insure bark was being measured, not bottom. Anything less than 10 centimeters or less than 50% coverage is noted as T or Trace on the charts.

Bark type is noted as fine (< 1 in dia.), chunk (1 to 5 in dia.), or large (> 5 in dia.). It may also be noted as a combination of several types. Large debris such as logs, cable, etc. is noted where applicable. Marine life or sensitive habitat, if any, is talked about in the discussion. Sport Scuba gear with digital gauges accurate to 1 ft. was used. All depths are shown in feet, converted to MLW. An area about 100 ft. on either side of transects 1 and 5 was swam to try and cover as much area as possible.

Sunny Cove
Bank Depth



Transect # 1

Station	Bark depth	Type	Water depth
0	no bark	n/a	2ft.
25	no bark	n/a	10ft.
50	20cm.	fine	20ft.

The rest of the transect had only trace amounts of bark.

Transect # 2

Station	Bark depth	Type	Water depth
0	no bark	n/a	3ft.
25	no bark	n/a	10ft.
50	15cm.	fine	18ft.

The rest of the transect had only trace amounts of bark.

Transect # 3

Station	Bark depth	Type	Water depth
0	no bark	n/a	3ft
25	no bark	n/a	13ft.
50	15cm.	fine	21ft.
75	10cm.	fine	26ft.

The rest of the transect had only trace amounts of bark.

Transect # 4

Station	Bark depth	Type	Water depth
0	no bark	n/a	1ft
25	no bark	n/a	9ft.
50	15cm.	fine	19ft.
75	15cm.	fine	26ft.

The rest of the transect had only trace amounts of bark.

Transect # 5

Station	Bark depth	Type	Water depth
0	no bark	n/a	2ft
25	no bark	n/a	9ft.
50	no bark	n/a	19ft.
75	15cm.	fine	26ft.

The rest of the transect had only trace amounts of bark.

SUNNY COVE
INTRODUCTION AND METHODS

The diving for the proposed SUNNY COVE site was done on July 8, 1995 by Bob Boes and Tim White using sport scuba gear. Bob Boes is a marine biologist with 18 years experience diving in southeast Alaska. Bob earned his degree from the University of Florida. Bob has been teaching scuba diving and diving Alaska since 1977. He has done many LTF studies for the forest service in the recent past. Tim White is a marine biologist with a specialty in fisheries. Tim is a graduate of Sheldon Jackson college. Tim is also a PADI divemaster with 6 years diving experience in southeast Alaska.

The diving was conducted using traditional sport scuba gear with digital depth gauges. Digital gauges are more accurate than the older style analog gauges, used in the past, so depth readings are more accurate especially in shallower water.

A 300 foot transect tape was laid out along the bottom using predetermined compass headings, established from points on shore. The USFS set up the shore sites using rebar and stakes to mark the beginning of each transect. A total of 5 transects were done spaced 100 feet apart, covering a total area of 400 feet.

A 3 ft. by 3 ft. square was established every 25 feet along each 300 foot transect. Bottom composition was noted as well as counting all plant and animal life. Where animals such as Acorn barnacles, limpets, etc. were too numerous to count they were noted with the value 100+.

Bouy tests were conducted to determine flow rate. A low profile bouy was used so wind would not be a factor.

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	50	MUD/LG.CHUNK BARK 100%	LAMINARIA 10%	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2	N/A	
		man made debris. cable etc.		ROCK SOLE(LEPIDOPSETTA BILNEATA)	1		
275	41	SAME, some cockle shells.	LAMINARIA 25%	NO LIFE		N/A	
250	36	SAME	SAME	ROCK SOLE	2	N/A	
				SUNFLOWER STAR(PYCNOPODEA HELIANTHOIDES)	1		
225	32	MUD/FINE BARK 100%	SAME	CUCUMBER	2	N/A	
200	27	SAME	SAME	NO LIFE		N/A	
175	23	SAME	EEL GRASS 10%	CRESCENT GUNNEL(PHOLIS LAETA)	1	N/A	
				CUCUMBER	1		
150	18	MUD, NO BARK	EEL GRASS 75%	SUNFLOWER STAR	1	N/A	
			BROWN ALGAE 10%				
			LAMINARIA 10%				
125	14	SAME	EEL GRASS 100%	CRESCENT GUNNEL	1	N/A	
100	12	COBBLE, NO BARK	EEL GRASS ENDS	HAIRY HERMIT CRAB(PAGURUS CAPILLATUS)	1	LIMPETS	15+
75	9	LG. COBBLE	FUCUS 75%	NO LIFE		LIMPETS	50+
						BARNACLES	100+
						PAGURID HERMIT CRABS	50+
50	6	SAME	SAME	NO LIFE		BLUE MUSSELS	100+
						BARNACLES	100+
25	EXPOSED	ROCKY SHORE	N/A	NO LIFE		N/A	
0	EXPOSED	SAME	BEACH GRASS	NO LIFE		N/A	

7/8/95 SUNNY COVE TRANSECT #2 COMPASS DIRECTION 158

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	60	COBBLE, LG. CHUNK BARK	LAMINARIA 20%	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2	N/A	
		man made debris					
275	56	SAME	SAME	CUCUMBER	1	N/A	
250	51	SAME	SAME	NO LIFE		N/A	
225	47	MUD/FINE BARK 100%	SAME	NO LIFE		N/A	
200	42	SAME	SAME	NO LIFE		N/A	
175	38	SAME	LAMINARIA 25%	CUCUMBER	3	N/A	
				CRESCENT GUNNEL(PHOLIS LAETA)	1		
150	33	SAME, LG COIL OF CABLE.	SAME	COPPER ROCKFISH(SEBASTES CAURINUS) JUVENILE	4	N/A	
				COONSTRIPE SHRIMP(PANDALUS DANAE)	6		
125	28	MUD/FINE BARK 100%	LAMINARIA 10%	CUCUMBER	2	N/A	
				ROCK SOLE(LEPIDOPSETTA BILNEATA)	1		
100	26	SAME	SAME	NO LIFE		N/A	
75	20	MUD/BARK 50%	LAMINARIA 10%	NO LIFE		N/A	
			GREEN ALGAE 10%				
50	12	ROCK, BASE OF LTF.	N/A	CRESCENT GUNNEL	1	BARNACLES	100+
						LIMPETS	25+
						PAGURID HERMIT CRABS	25+
25	6	SAME	N/A	NO LIFE		BARNACLES	100+
						LIMPETS	50+
0	EXPOSED	LG. ROCKS	NA	NO LIFE		N/A	

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	60	COBBLE, LG. CHUNK BARK 75%	LAMINARIA 10%	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2	N/A	
				ROCK SOLE(LEPIDOPSETTA BILNEATA)	1		
275	58	SAME	SAME	CUCUMBER	1	N/A	
250	56	COBBLE/MUD/BARK 100%	SAME	NO LIFE		N/A	
225	53	SAME	SAME	NO LIFE		N/A	
200	50	SAME, BLUE MUSSEL SHELLS	SAME	NO LIFE		N/A	
175	44	MUD,SM. GRAVEL,FINE BARK 100%	LAMINARIA 25%	CRESCENT GUNNEL(PHOLIS LAETA)	1	N/A	
150	42	MUD,FINE BARK 100%	LAMINARIA 75%	CUCUMBER	3	N/A	
				ROCK SOLE	1		
125	38	SAME	SAME	NO LIFE		N/A	
100	32	SAME	LAMINARIA 25%				
			BROWN ALGAE	SUNFLOWER STAR(PYCNOPODEA HELIANTHOIDES)	1	N/A	
75	26	ROCKY,BASE OF LTF	LAMINARIA 100%	NO LIFE		N/A	
50	13	ROCKY	BROWN ALGAE 75%	NO LIFE		LIMPETS	25+
						PAGURID HERMIT CRABS	25+
25	6	ROCKY	N/A	NO LIFE		BARNACLES	100+
						LIMPETS	25+
0	EXPOSED	ROCKY	N/A	NO LIFE		N/A	

7/8/95

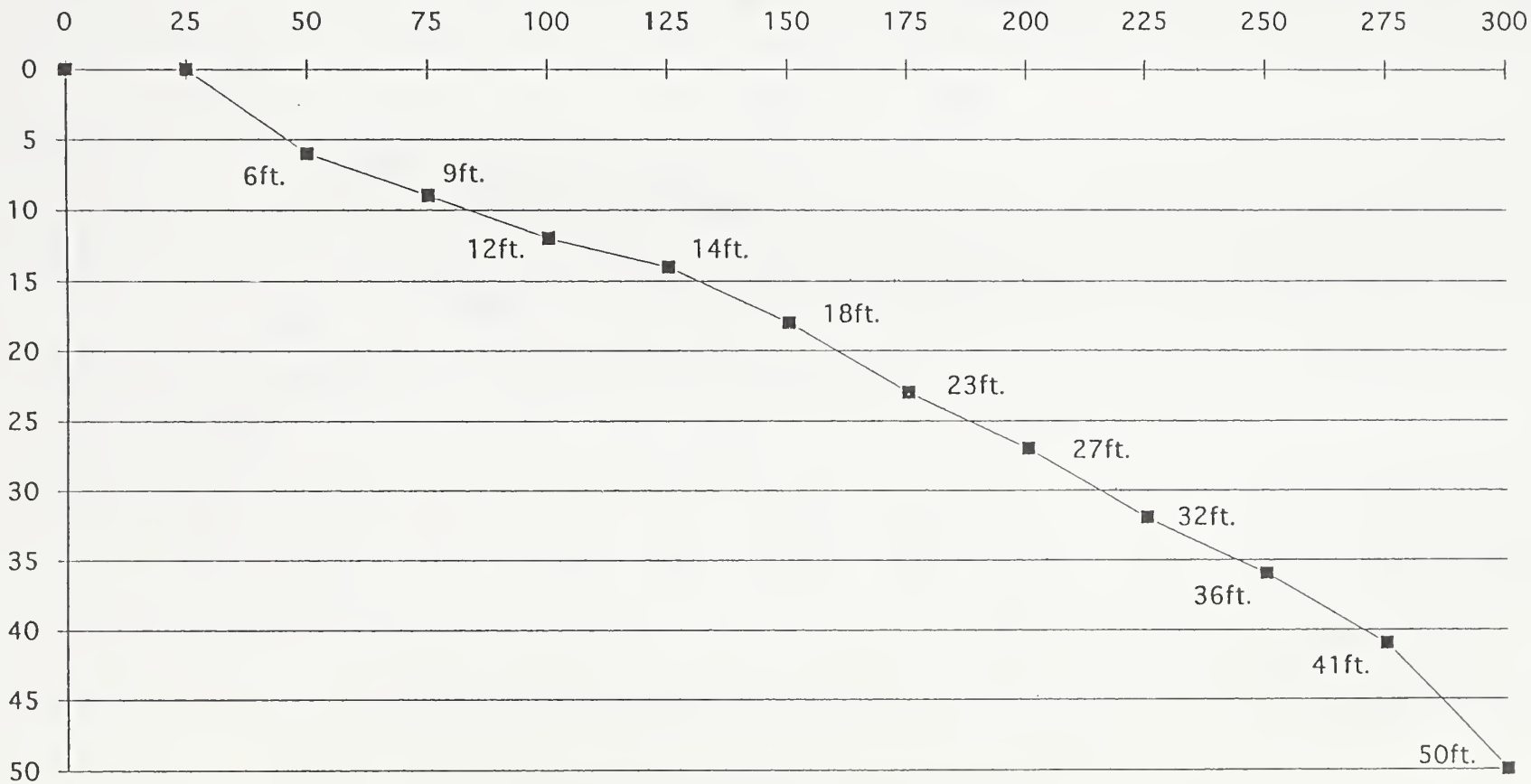
SUNNY COVE TRANSECT #4

COMPASS DIRECTION 158

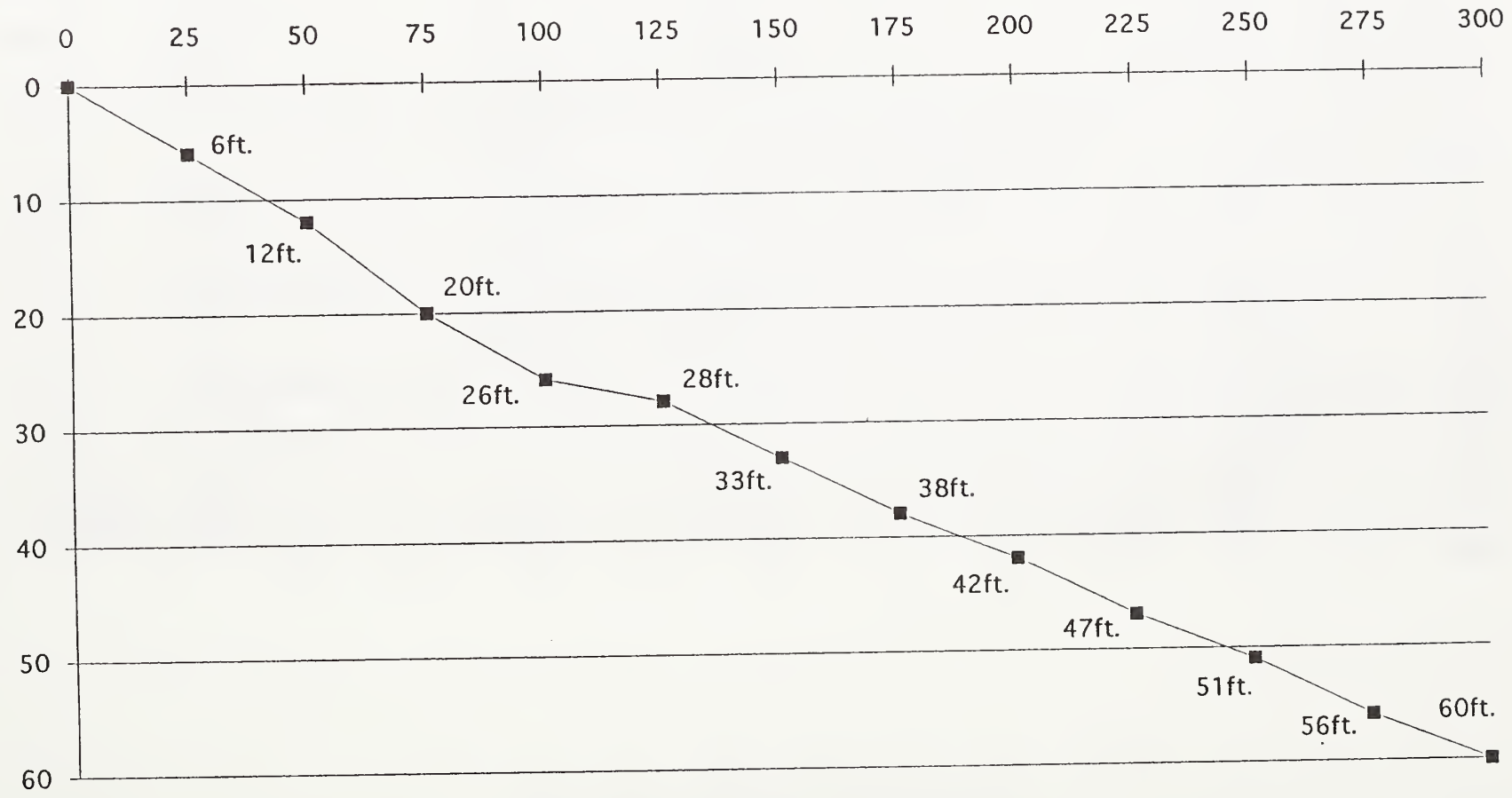
STATION	DEPTH FT	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	59	COBBLE,LG. BARK CHUNKS 100%	LAMINARIA 20%	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	1	N/A	
275	55	SAME	LAMINARIA 10%	CUCUMBER	1	N/A	
250	53	COBBLE,FINE BARK 10%	N/A	CRESCENT GUNNEL(PHOLIS LAETA)	1	N/A	
				SUNFLOWER STAR(PYCNOPODEA HELIANTHOIDES)	1		
				HAIRY TRITON(FUSITRITON OREGONENSIS)	4		
225	48	COBBLE,LG. BARK 10%	N/A	CUCUMBER	3	N/A	
200	45	COBBLE LG. BARK 80%	LAMINARIA 20%	NO LIFE		N/A	
			GREEN ALGAE 10%				
175	41	SAME	SAME	CRESCENT GUNNEL	1	N/A	
				CUCUMBER	1		
150	38	COBBLE,MUD,FINE BARK 80%	N/A	NO LIFE		N/A	
125	33	MUD, FINE BARK 100%	N/A	SUNFLOWER STAR	1	N/A	
				CUCUMBER	1		
100	28	SAME	N/A	NO LIFE		N/A	
75	23	COBBLE, NO BARK	LAMINARIA 50%	GRUNT SCULPIN(RHAMPHOCOTTUS RICHARDSONI)	1	N/A	
50	13	COBBLE, ROCK	LAMINARIA 25%	NO LIFE		BARNACLES	100+
			FUCUS 10%			LIMPETS	50+
25	5	ROCKY	FUCUS 50%	NO LIFE		BARNACLES	100+
			BROWN ALGAE			LIMPETS	100+
						SNAILS	25+
0	EXPOSED	ROCKY	N/A	NO LIFE		N/A	

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	46	MUD,LG. CHUNK BARK 80%	LAMINARIA 10%	NO LIFE		N/A	
275	44	SAME	SAME	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	3	N/A	
250	40	SAME	SAME	RAZOR CLAM(SILIQUA PATULA)	3	N/A	
225	37	SAME	SAME	CUCUMBER	1	N/A	
200	32	SAME	SAME	CUCUMBER	1	N/A	
175	27	MUD, FINE BARK 100%	LAMINARIA 20%	NO LIFE		N/A	
			BROWN ALGAE				
150	24	SAME	N/A	BLACKEYE GOBY(CORYPHOPTERUS NICHOISI)	1	TUBE WORM	20+
125	20	SAME	LAMINARIA 10%	NO LIFE		N/A	
			FUCUS 20%				
100	13	SANDY, MUD,NO BARK	EEL GRASS 90%	NO LIFE		N/A	
75	9	COBBLE	FUCUS 10%	NO LIFE		LIMPETS	10+
						BARNACLES	100+
50	5	ROCK, LG. COBBLE	FUCUS 10%	NO LIFE		PAGURID HERMIT CRABS	20+
						BARNACLES	100+
						LIMPETS	8
25	EXPOSED	ROCK	N/A	NO LIFE		N/A	
0	EXPOSED	SAME	N/A	NO LIFE		N/A	

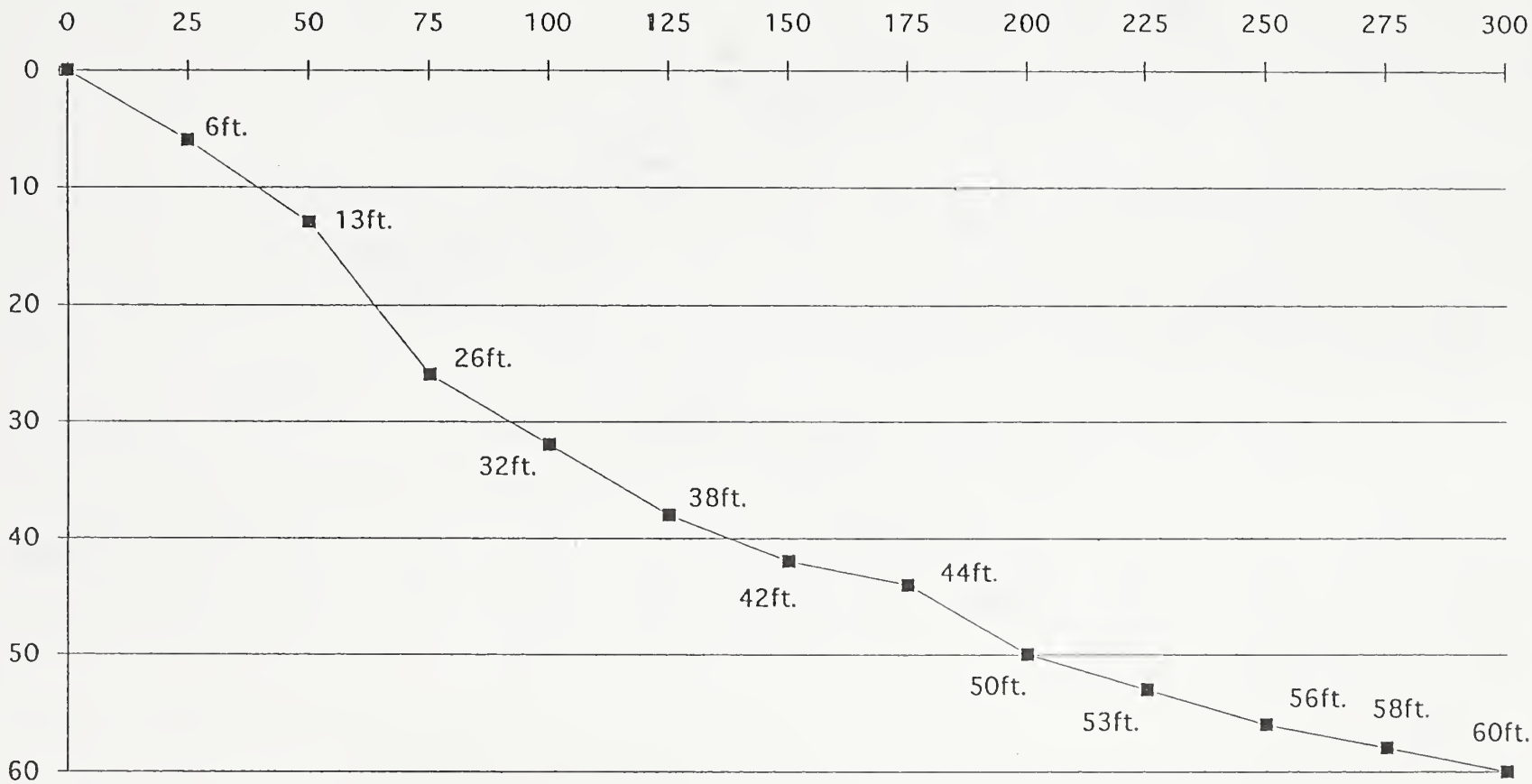
SUNNY COVE TRANSECT #1DEPTH PROFILE



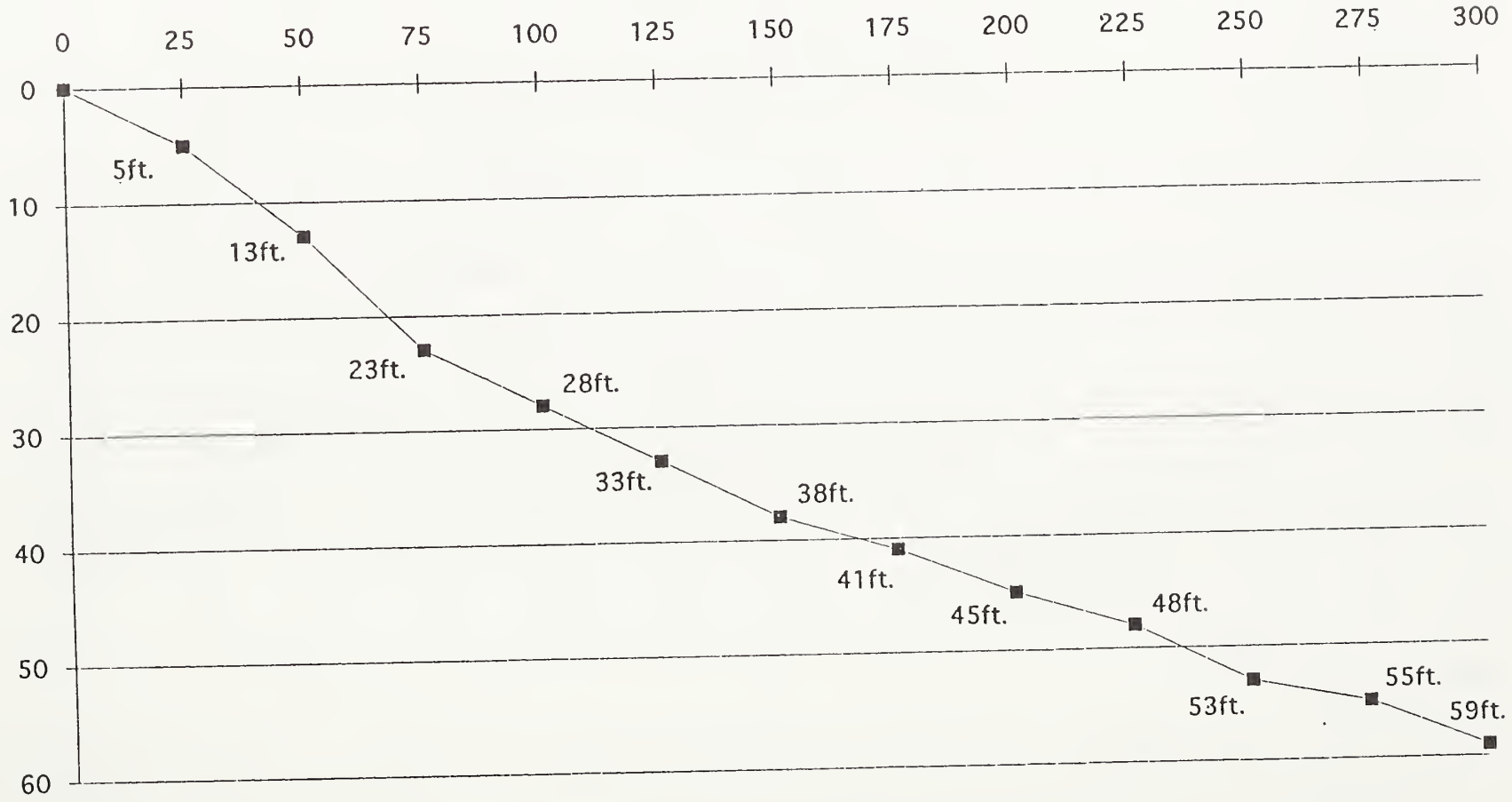
SUNNY COVE TRANSECT #2 DEPTH PROFILE



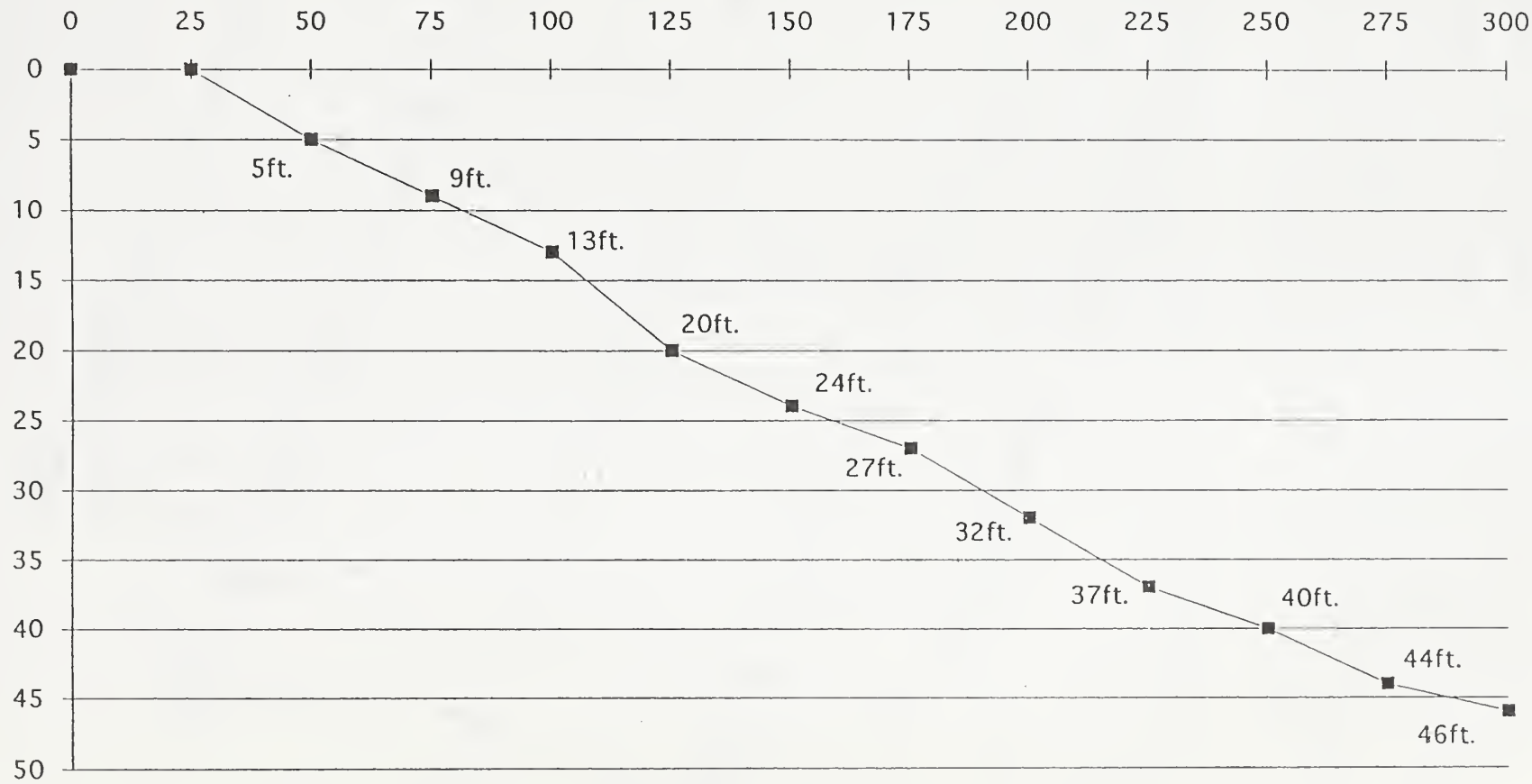
SUNNY COVE TRANSECT #3 DEPTH PROFILE



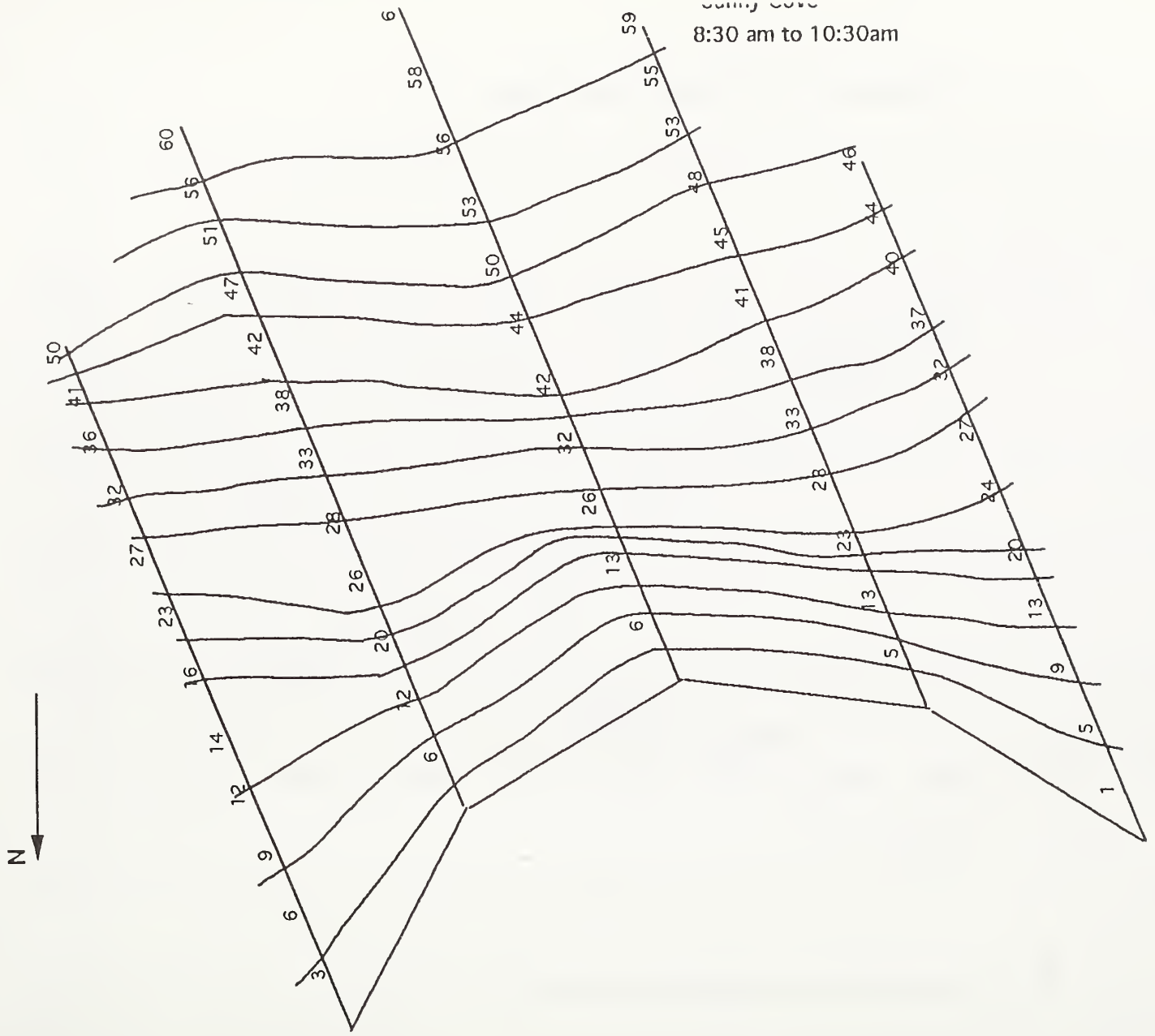
SUNNY COVE TRANSECT #4 DEPTH PROFILE



SUNNY COVE TRANSECT #5 DEPTH PROFILE



8:30 am to 10:30am



Gradient 4' Scale 1.7" = 100'

SUNNY COVE LTF STUDY
DISCUSSION AND CONCLUSION

Sunny cove is the site of a former log transfer site and all transects began from there. The site had a significant amount of bark accumulation on all transects. A fair amount of man made debris was found also. No significant life or sensitive habitat was found. The small band of eel grass did not seem to be supporting any breeding habitat. The only animal found in any number was the Sea Cucumber(Parastichopus californicus). The amount seen on all transects was not sufficient for commercial harvest.

Bouy tests showed a significant current during the tide change. Judging by the amount and area of bark dispersal, from the prior logging operation, the flow is quite good. Low tide was at 4:06 a.m. a 0.7ft. High tide was 10:25 a.m. a 12.5ft. Diving was started a approximately 8:30 a.m.

From the underwater perspective Sunny Cove would make a good site for an LTF once again.

10 MILE
INTRODUCTION AND METHODS

The diving for the proposed 10 MILE site was done on August 11, 1995 by Bob Boes and Tim White using sport scuba gear. Bob Boes is a marine biologist with 18 years experience diving in southeast Alaska. Bob earned his degree from the University of Florida. Bob has been teaching scuba diving and diving Alaska since 1977. He has done many LTF studies for the forest service in the recent past. Tim White is a marine biologist with a specialty in fisheries. Tim is a graduate of Sheldon Jackson college. Tim is also a PADI divemaster with 6 years diving experience in southeast Alaska.

The diving was conducted using traditional sport scuba gear with digital depth gauges. Digital gauges are more accurate than the older style analog gauges, used in the past, so depth readings are more accurate especially in shallower water.

A 300 foot transect tape was laid out along the bottom using predetermined compass headings, established from points on shore. The USFS set up the shore sites using rebar and stakes to mark the beginning of each transect. A total of 5 transects were done spaced 100 feet apart, covering a total area of 400 feet.

A 3 ft. by 3 ft. square was established every 25 feet along each 300 foot transect. Bottom composition was noted as well as counting all plant and animal life. Where animals such as Acorn barnacles, limpets, etc. were too numerous to count they were noted with the value 100+.

Bouy tests were conducted to determine flow rate. A low profile bouy was used so wind would not be a factor.

8/11/95

10 MILE TRANSECT #1

COMPASS DIRECTION 180

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	2	SAND	N/A	NO LIFE		N/A	
275	EXPOSED	SAND	GREEN ALGAE	NO LIFE		N/A	
250	EXPOSED	SAND, COBBLE	GREEN ALGAE	NO LIFE		BLUE MUSSELS	10+
			FUCUS 10%			BARNACLES	100+
						PAGURID HERMIT CRABS	10+
						LIMPETS	10+
225	SAME	SAME	SAME	NO LIFE		SAME	
200	SAME	SAME	SAME	NO LIFE		SAME	
175	SAME	SAME	SAME	NO LIFE		SAME	
150	SAME	SAME	SAME	NO LIFE		SAME	
125	SAME	SAME	SAME	NO LIFE		SAME	
100	SAME	SAME	SAME	NO LIFE		SAME	
75	SAME	COBBLE, ROCK	FUCUS 25%	NO LIFE		BARNACLES	50+
						LIMPETS	10+
50	SAME	ROCKY, COBBLE	FUCUS 10%	NO LIFE		SAME	
25	SAME	SAME	SAME	NO LIFE		N/A	
0	SAME	SAME	BEACH GRASS	NO LIFE		N/A	

8/11/95 10 MILE TRANSECT #2 COMPASS DIRECTION 180

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	21	SAND, STEEP SLOPE	LAMINARIA 10%	ROCK SOLE(LEPIDOPSETTA BILINEATA)	2	N/A	
				CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2		
				COCKLE(CLINOCARDIUM NUTTALLII)	6		
275	10	SAND, STEEP SLOPE	N/A	DUNGENESS CRAB(CANCER MAGISTER) JV.	1	N/A	
250	1	SAME	N/A	NO LIFE		N/A	
225	EXPOSED	SAND	N/A	NO LIFE		N/A	
200	EXPOSED	COBBLE, SAND	GREEN ALGAE 25%	NO LIFE		BARNACLES	50+
			FUCUS 10%			BLUE MUSSELS	10+
						LIMPETS	10+
						PAGURID HERMIT CRABS	10+
						PURPLE SHORE CRAB	2
175	SAME	SAME	FUCUS 25%	NO LIFE		SAME	
150	SAME	SAME	SAME	NO LIFE		SAME	
125	SAME	COBBLE, ROCK	SAME	NO LIFE		BARNACLES	100+
						LIMPETS	10+
100	SAME	SAME	FUCUS, SPARSE	NO LIFE		SAME	
75	SAME	ROCKY	SAME	NO LIFE		N/A	
50	SAME	SAME	N/A	NO LIFE		N/A	
25	SAME	SAME	BEACH GRASS	NO LIFE		N/A	
0	SAME	SAME	SAME	NO LIFE		N/A	

8/11/95

10 MILE TRANSECT #3

COMPASS DIRECTION180

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	47	SAND, STEEP SLOPE	N/A	NO LIFE		N/A	
275	38	SAME	N/A	ROCK SOLE(LEPIDOPSETTA BILNEATA)	2	N/A	
250	31	SAME	N/A	KELP GREENLING(HEXAGRAMMOS DECAGRAMMUS)	1	N/A	
				DUNGENESS CRAB(CANCER MAGISTER)	1		
				SUNFLOWER STAR(RYCNOPODIA HELIANTHOIDES)	1		
225	19	SAME	LAMINARIA 10%	ROCK SOLE	1	N/A	
200	7	SAME, TOP OF DROP OFF	N/A	SUNFLOWER STAR	1	N/A	
175	EXPOSED	SAND COBBLE	GREEN ALGAE 10%	N/A		BLUE MUSSEL	25+
						BARNACLES	50+
150	SAME	SAME	SAME	N/A		SAME	
125	SAME	SAME	FUCUS 10%	NO LIFE		BARNACLES	100+
						LIMPETS	25+
						PAGURID HERMIT CRABS	10+
						SNAILS(?)	10+
100	SAME	COBBLE, ROCK	FUCUS 25%	N/A		SAME	
75	SAME	ROCK, COBBLE	FUCUS, SPARSE	N/A		N/A	
50	SAME	SAME	N/A	N/A		N/A	
25	SAME	SAME	BEACH GRASS	N/A		N/A	
0	SAME	ROCKY	SAME	N/A		N/A	

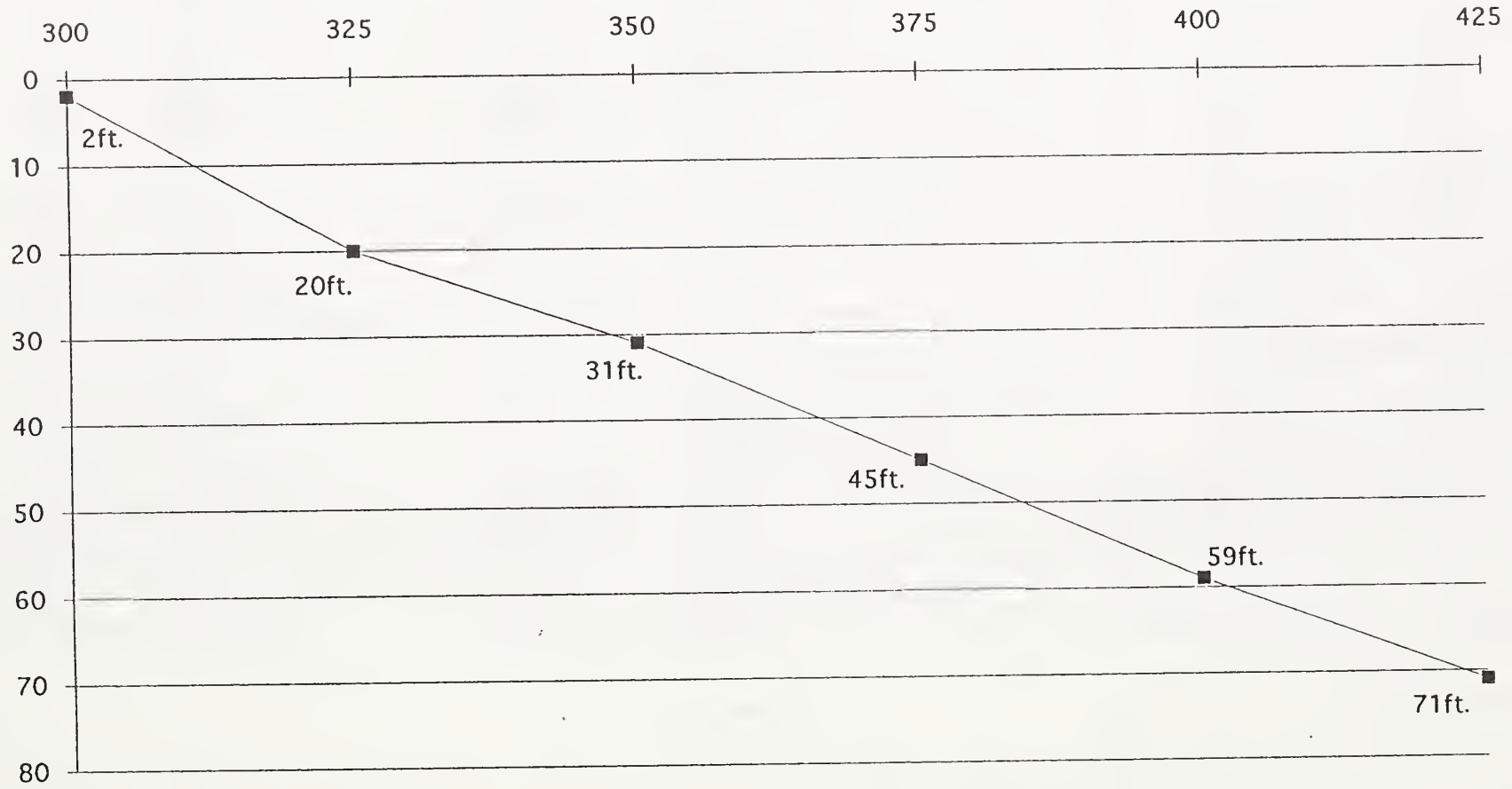
8/11/95 10 MILE TRANSECT #4 COMPASS DIRECTION 180

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	44	SAND,STEEP SLOPE	LAMINARIA 10%	SUNFLOWER STAR(PYCNOPODIA HELIANTHOIDES)	1	N/A	
				SCALLOP(CHLAMYS HASTATA)	1	N/A	
275	34	SAME	SAME	ROCK SOLE(LEPDOPSETTA BILNEATA)	2	N/A	
250	25	SAME	SAME	ROCK SOLE	4	N/A	
				SUNFLOWER STAR	1		
225	17	SAME	SAME	NO LIFE		N/A	
200	9	SAND, TOP OF DROP OFF	EEL GRASS(TRACE)	NO LIFE		N/A	
175	3	SAND	LAMINARIA 10%	NO LIFE		N/A	
			GREEN ALGAE 10%				
150	1	SAND	N/A	NO LIFE		N/A	
125	EXPOSED	SAND, COBBLE	FUCUS 25%	NO LIFE		BARNACLES	100+
						LIMPETS	10+
						PAGURID HERMIT CRABS	10+
						SNAILS(?)	10+
100	SAME	COBBLE	SAME	NO LIFE		SAME	
75	SAME	COBBLE, ROCK	SAME	NO LIFE		SAME	
50	SAME	SAME	FUCUS (SPARSE)	NO LIFE		N/A	
25	SAME	ROCK	N/A	NO LIFE		N/A	
0	SAME	ROCK	BEACH GRASS	NO LIFE		N/A	

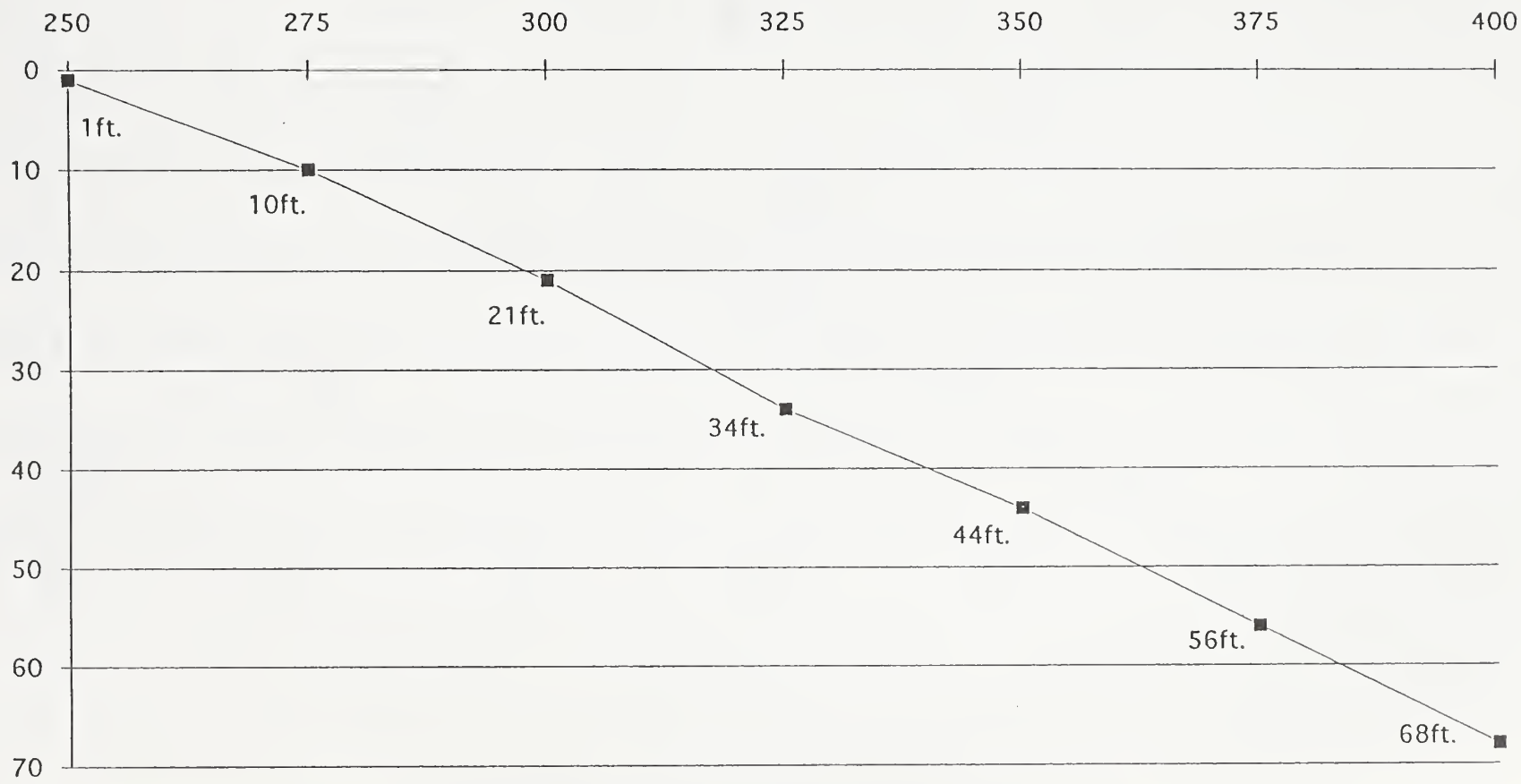
8/11/95 10 MILE TRANSECT #5 COMPASS DIRECTION 180

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	ABUNDANT SPECIES	NUMBER
300	47	SAND, STEEP SLOPE	N/A	ROCK SOLE(LEPDOPSETTA BILNEATA)	6	N/A	
275	38	SAME	N/A	NO LIFE		N/A	
250	31	SAME	LAMINARIA 10%	ROCK SOLE	3	N/A	
				SNAKE PRICKLEBACK(LUMPENUS SAGITTA)	1		
				SEA PEN(PTILOSARCUS GURNEYI)	1		
225	21	SAME	SAME	SUNFLOWER STAR(PYCNOPODIA HELIANTHOIDES)	1	N/A	
				CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2		
200	13	SAND, TOP OF DROP OFF	LAMINARIA 25%	ROCK SOLE	2	N/A	
175	5	SAND	EEL GRASS, TRACE	NO LIFE		PURPLE SHORE CRAB	3
						(HEMIGRASPUS NUDUS)	
150	4	SAND, COBBLE	GREEN ALGAE 10%	GREEN URCHIN	6	BLUE MUSSEL	6
				(STRONGYLOCENTROTUS DROEBACHIENSIS)		BARNACLES	100+
				MUD STAR(LUIDIA FOLIOLATA)	2	LIMPETS	25+
125	2	COBBLE, ROCK	GREEN ALGAE 10%	NO LIFE		SAME	
100	EXPOSED	SAME	FUCUS 25%	NO LIFE		SAME	
75	EXPOSED	ROCK	SAME	NO LIFE		BARNACLES	SPARSE
						LIMPETS	SPARSE
50	EXPOSED	SAME	BEACH GRASS	NO LIFE		SAME	
25	EXPOSED	SAME	SAME	NO LIFE		SAME	
0	EXPOSED	SAME	SAME	NO LIFE		N/A	

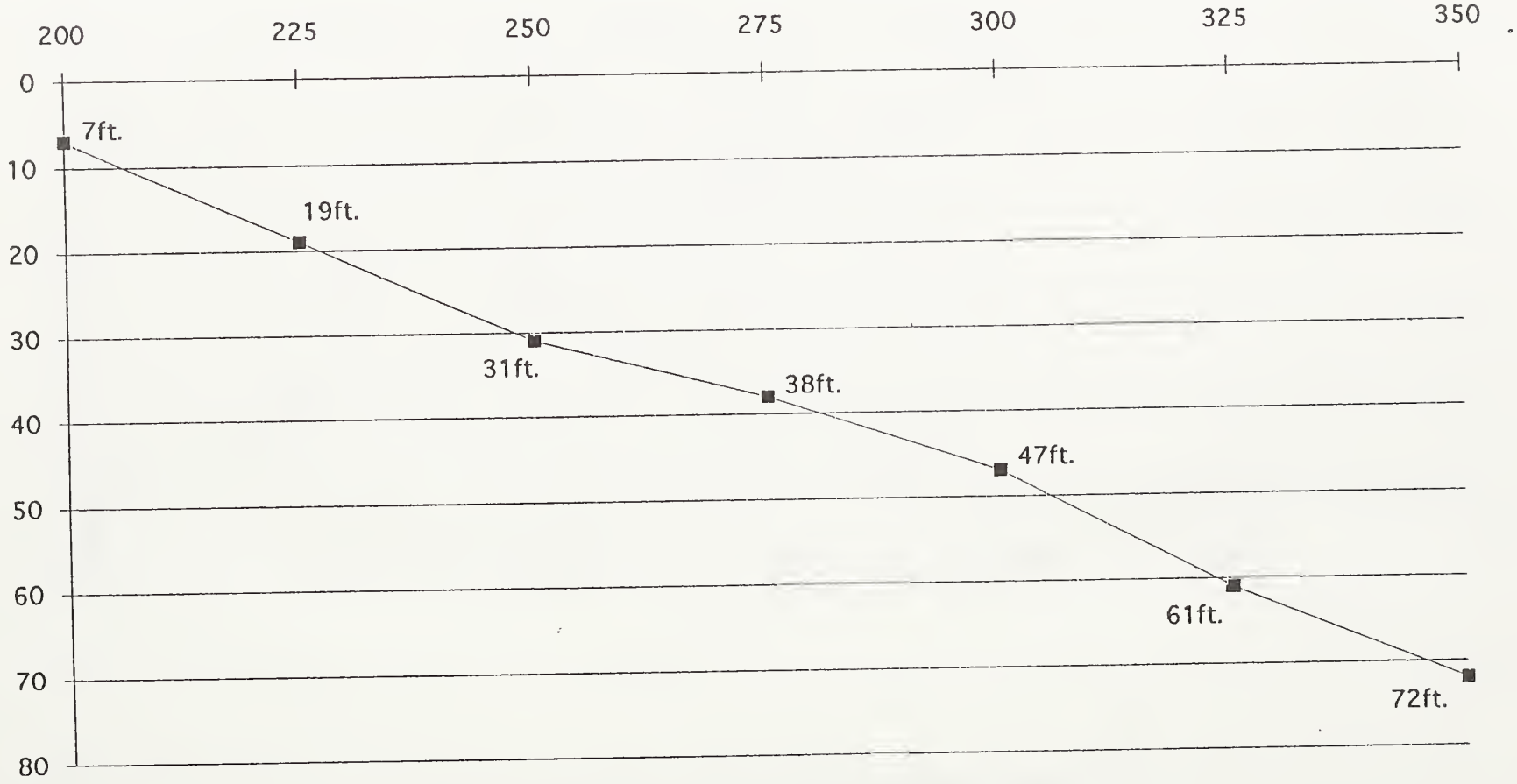
10 MILE TRANSECT #1 DEPTH PROFILE FROM STATION 300



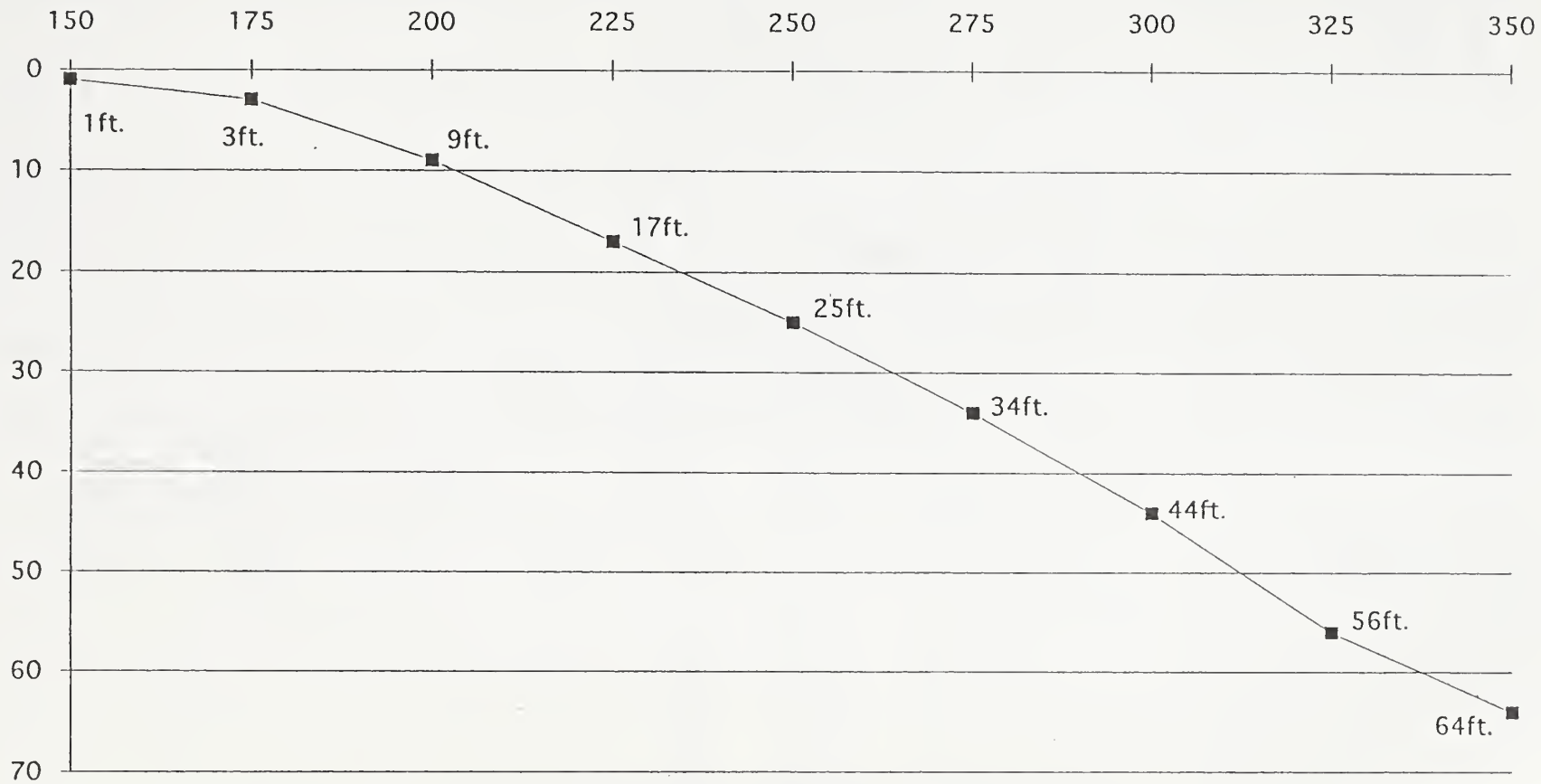
10 MILE TRANSECT #2 DEPTH PROFILE FROM STATION 250



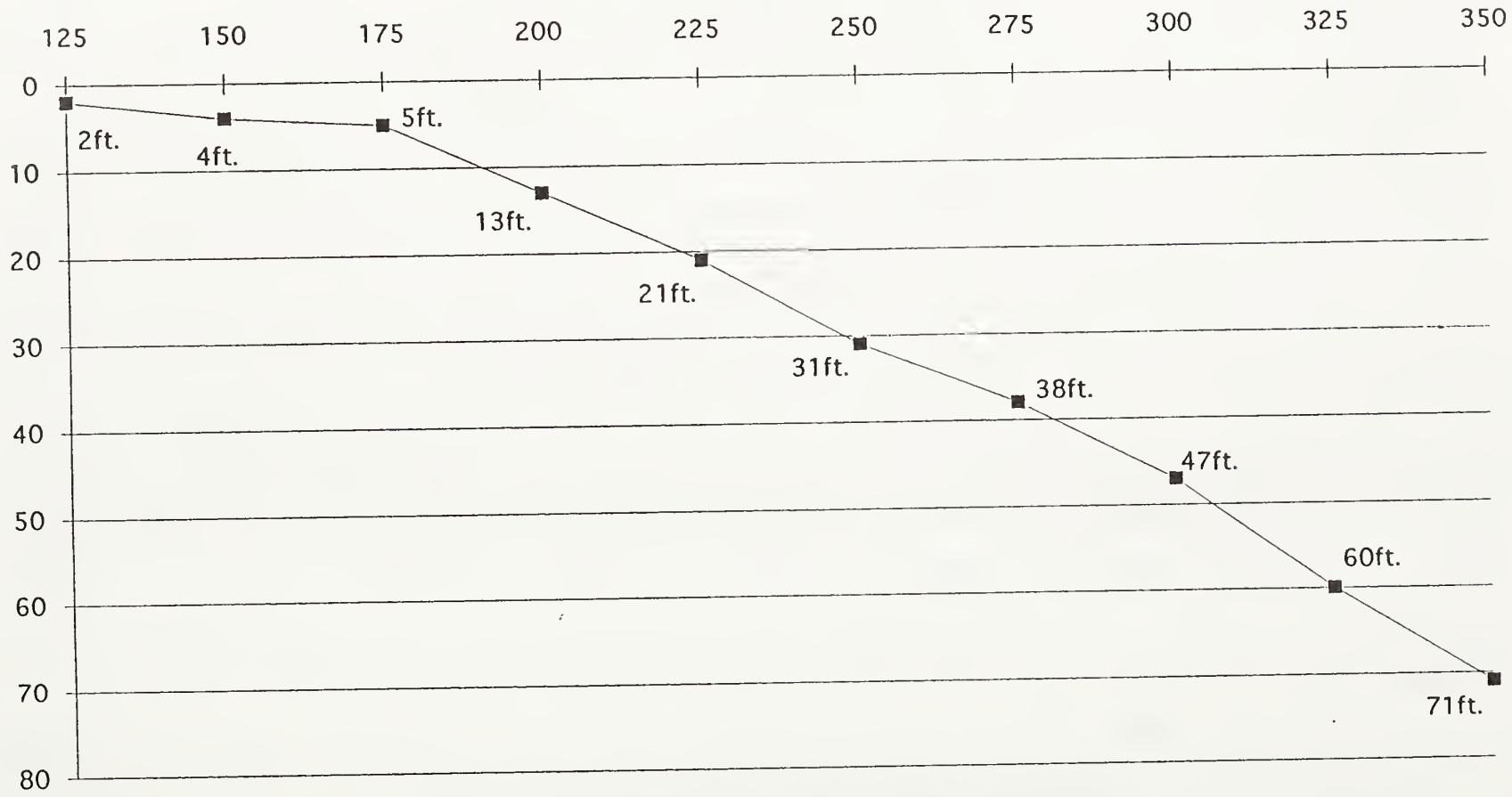
10 MILE TRANSECT #3 DEPTH PROFILE FROM STATION 200



10 MILE TRANSECT #4 DEPTH PROFILE FROM STATION 150



10 MILE TRANSECT #5 DEPTH PROFILE FROM STATION 125



10 MILE
DISCUSSION AND CONCLUSION

The 10 Mile site is a new site that has never previously been logged. The site presented some unique problems when laying out the transect tape. As evidenced in the report, because of the long tidal flat, the drop off did not begin until about the 200ft. station along the tape. Some transects even further. We also began the diving at 8:30 a.m. with a -3.7 tide. What we ended up doing was extending the tape from the drop off point to a point at or greater than 60ft. The depth profiles show a very steep slope starting at the drop off. We also swam approximately 200ft. beyond each end of the transect area to determine that the slope and bottom configuration were the same. It was consistent with the transect area.

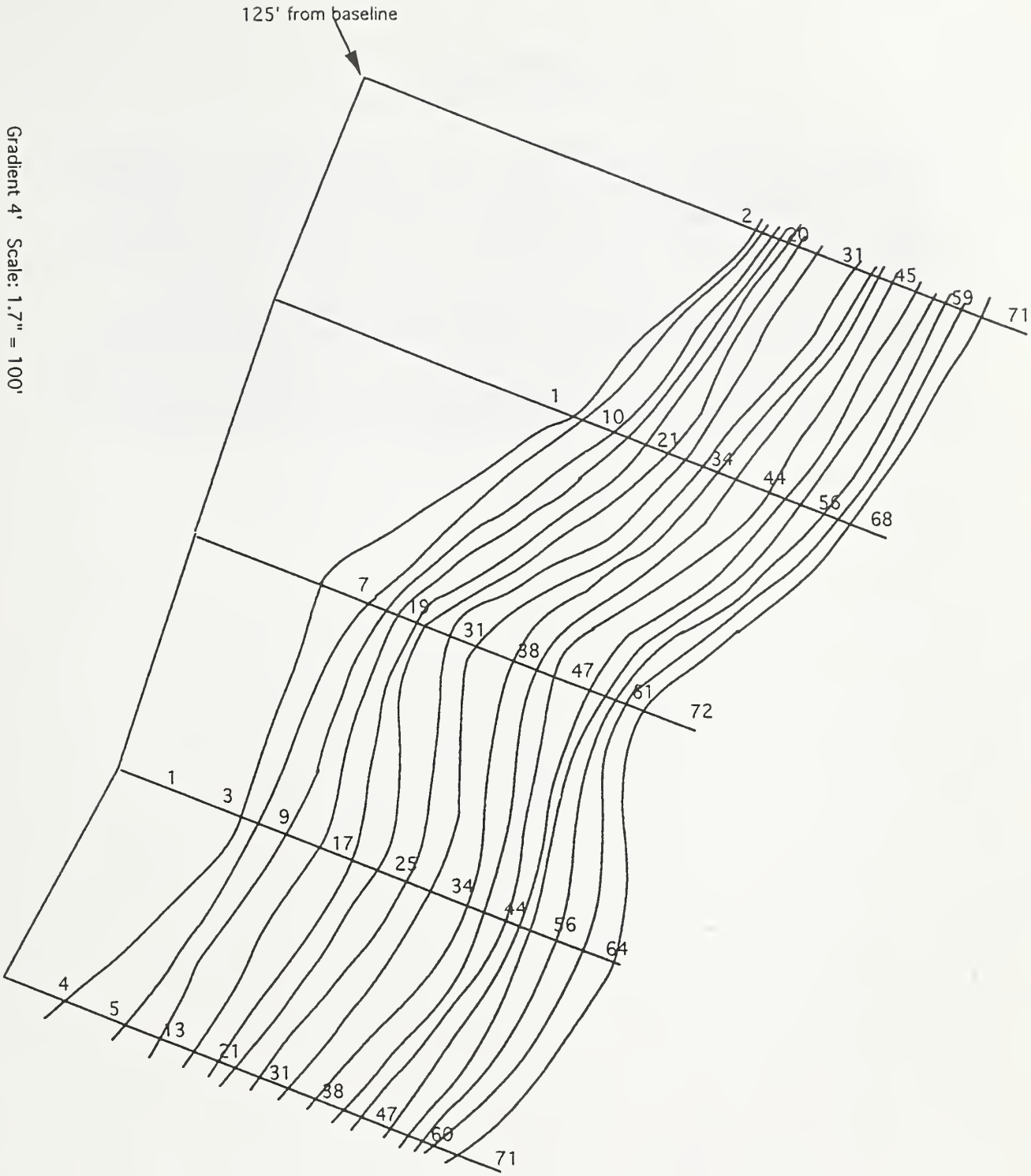
No significant habitat or animal life was found. The long tidal flat area was very typical for the area. Mainly barnacles, limpets, small hermit crabs, and some blue mussels. The drop off showed little signs of life with no breeding habitat. While we did not physically count the animals on transects 1&2 we did swim the entire area twice and it was consistent with the rest of the transect area. Along transect #2 there was a thin area of eel grass but we did not deem it significant.

The current was extremely strong, especially from the drop off to about 50ft. We sometimes had a hard time keeping the transect tape straight. Flushing action should be very good. Dye tests showed very quick dispersal.

From the underwater perspective, once the drop off is reached, nothing significant was found making 10 MILE a good area for a log transfer site.

REFERENCE MATERIAL

1. Alaska's Saltwater Fishes and Other Sea Life
   Doyne W. Kessler
2. Coastal Fishes of the Pacific Northwest
   Andy Lamb and Phil Edgell
3. Tidepool and Reef Marinelife Guide to the Pacific Northwest Coast
   Rick M. Harbo
4. Probably More Than You Want to Know About the Fishes of the Pacific Coast
   Robin Milton Love
5. Pacific Fishes of Canada
   John Lawson Hart
6. Guide to the Coastal Marine Fishes of California
   University of California


125' from baseline
Gradient 4' Scale: 1.7" = 100'
2
20
31
45
59
71
1
10
21
34
44
56
68
7
19
31
38
47
61
72
1
3
9
17
25
34
44
56
64
4
5
13
21
31
38
47
60
71

SUNNY COVE
DISCUSSION AND CONCLUSION

The new proposed LTF site in Sunny Cove is several hundred yards from an old existing site. Three of the five transects easily attained the 60 foot mark within the 300 foot transect. The two end transects, 1 & 5, were not as steep a slope. Flushing action should be very good as the current was strong even at depth. Given the lack of bark buildup at the old LTF, which is more protected, this site should have even better dispersal. .
No significant or sensitive habitat was found. The only commercially valuable animal found was the sea cucumber(Parastichopus californicus) and its numbers were not great enough for commercial harvest. No eel grass was noted on any transect. A 100 foot area on either side of transects 1 and 5 was swam to make sure no sensitive habitat was nearby. From the underwater perspective this would make a good location for an LTF site.

REFERENCE MATERIAL

1. Alaska's Salt Water Fishes and Other Sea Life. Doyne W. Kessler

2. Coastal Fishes of the Pacific Northwest. Andy Lamb and Phil Edgell

3. Tidepool and Reef Marine Life Guide to the Pacific N.W. Coast. Rick M. Harbo

4. Probably More Than Yor Want To Know About The Fishes Of The Pacific Coast. Robin Milton Love

5. Pacific Fishes of Canada. John Lawson Hart

6. Guide to the Coastal Marine Fishes of California. University of California

SUNNY COVE
BIOLOGICAL SURVEY
CONDUCTED BY BOB BOES
ON 7/21/96

SUNNY COVE
INTRODUCTION

The diving for the Sunny Cove site was performed on 7/21/96 by Bob Boes, using sport scuba gear. Bob is a marine biologist with 19 years experience diving in Southeast Alaska. Bob earned his degree from the University of Florida. Bob has been teaching Scuba and diving Alaska since 1977. He has done many LTF site studies for the Forest service in the recent past.

The diving was conducted using traditional sport Scuba gear, with digital depth gauges. Digital gauges are more accurate than the older style analog gauges, used in the past, so depth readings are more accurate, especially in shallower water.

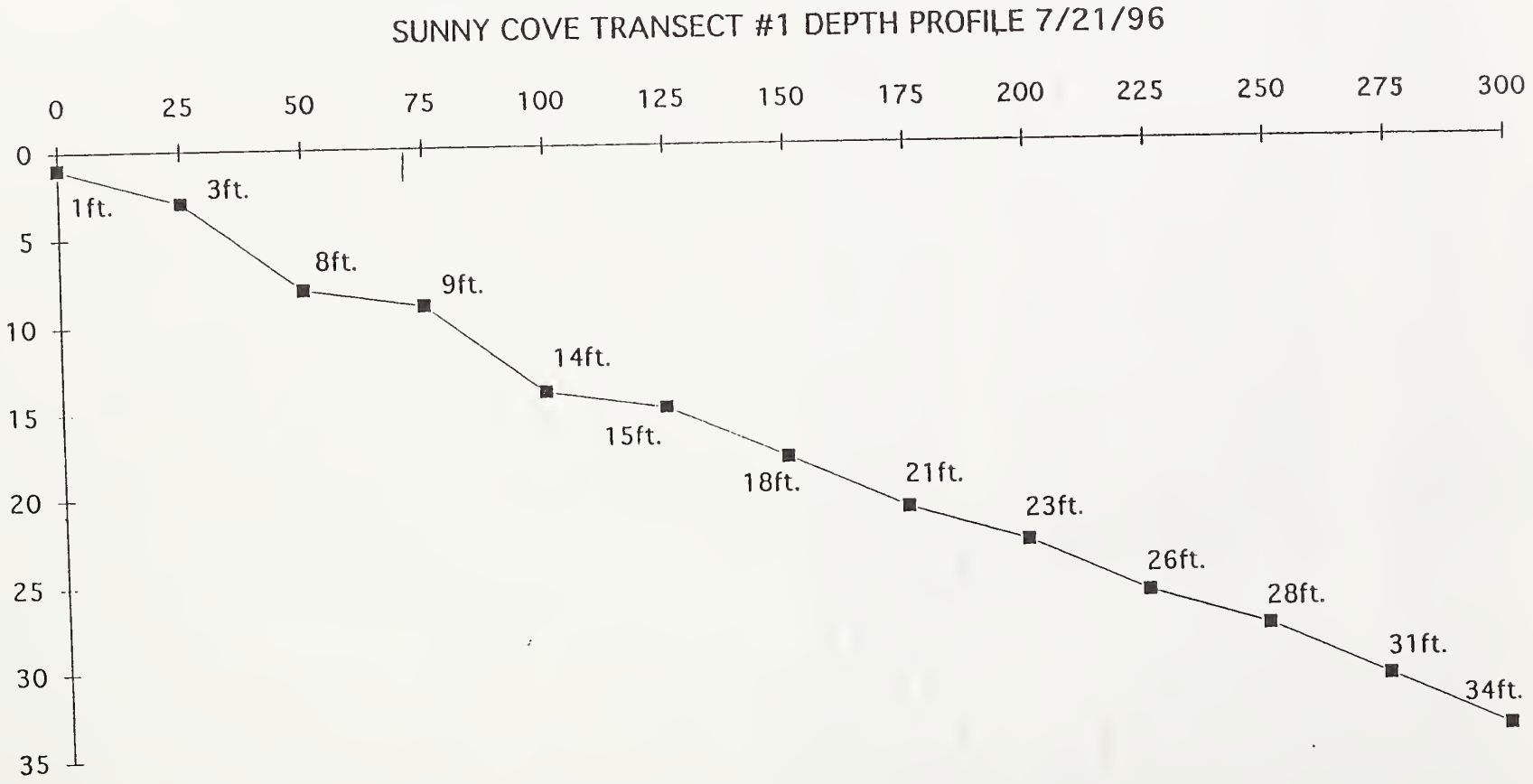
A 300 foot transect tape was laid out along the bottom, to a maximum depth of 65 feet, using predetermined compass headings, established from points on shore. The USFS set up the shore sites. A total of 5 transects spaced 100 feet apart were done. Data was recorded every 25 feet in an area 3ft by 3ft along each transect.

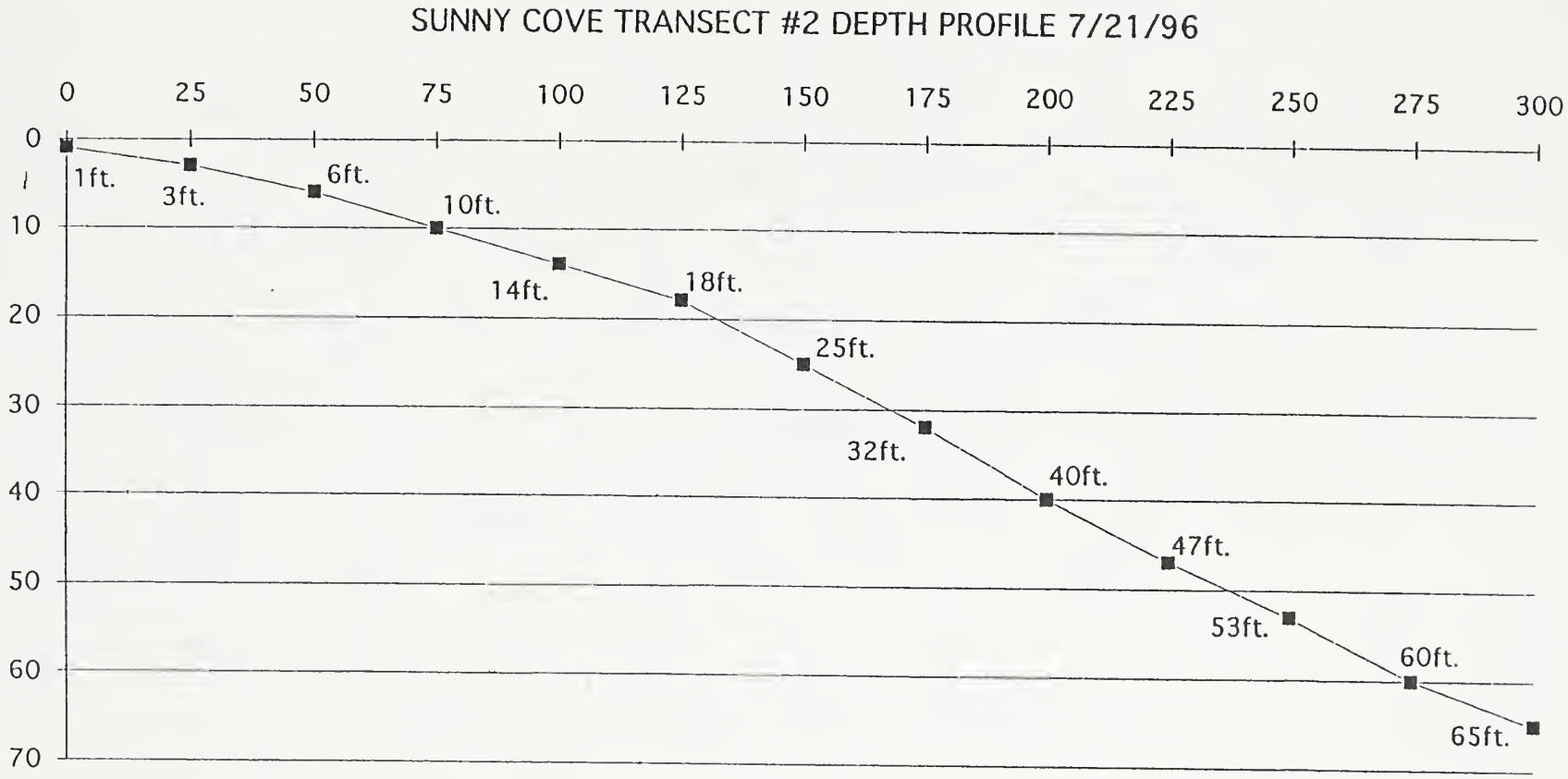
Bottom composition was noted as well as counting all plant and animal life. Plant life is shown in percentage of bottom covered. Where animals such as snails, limpets, etc, were too numerous to count a 1ft by 1ft square was established within each 3 by 3 area and numbers were estimated.

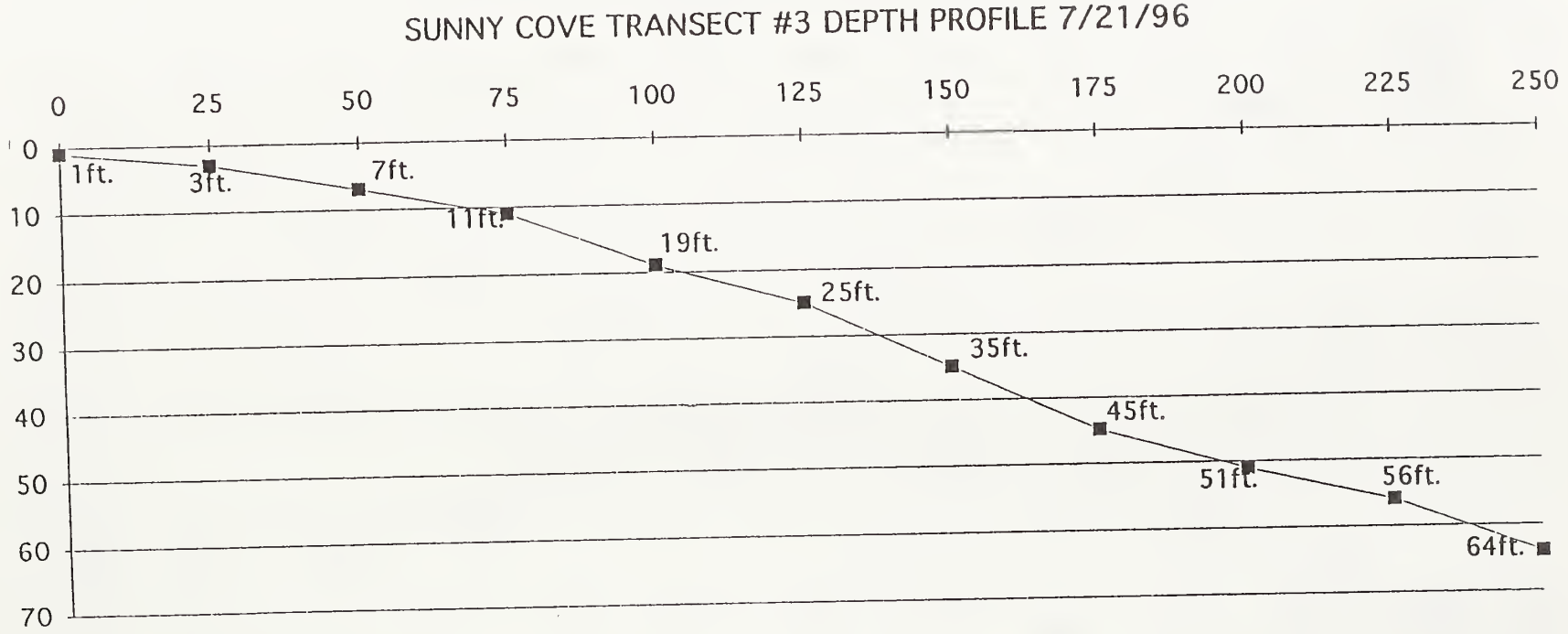
Current was determined by using a low profile buoy, timed over a measured distance.

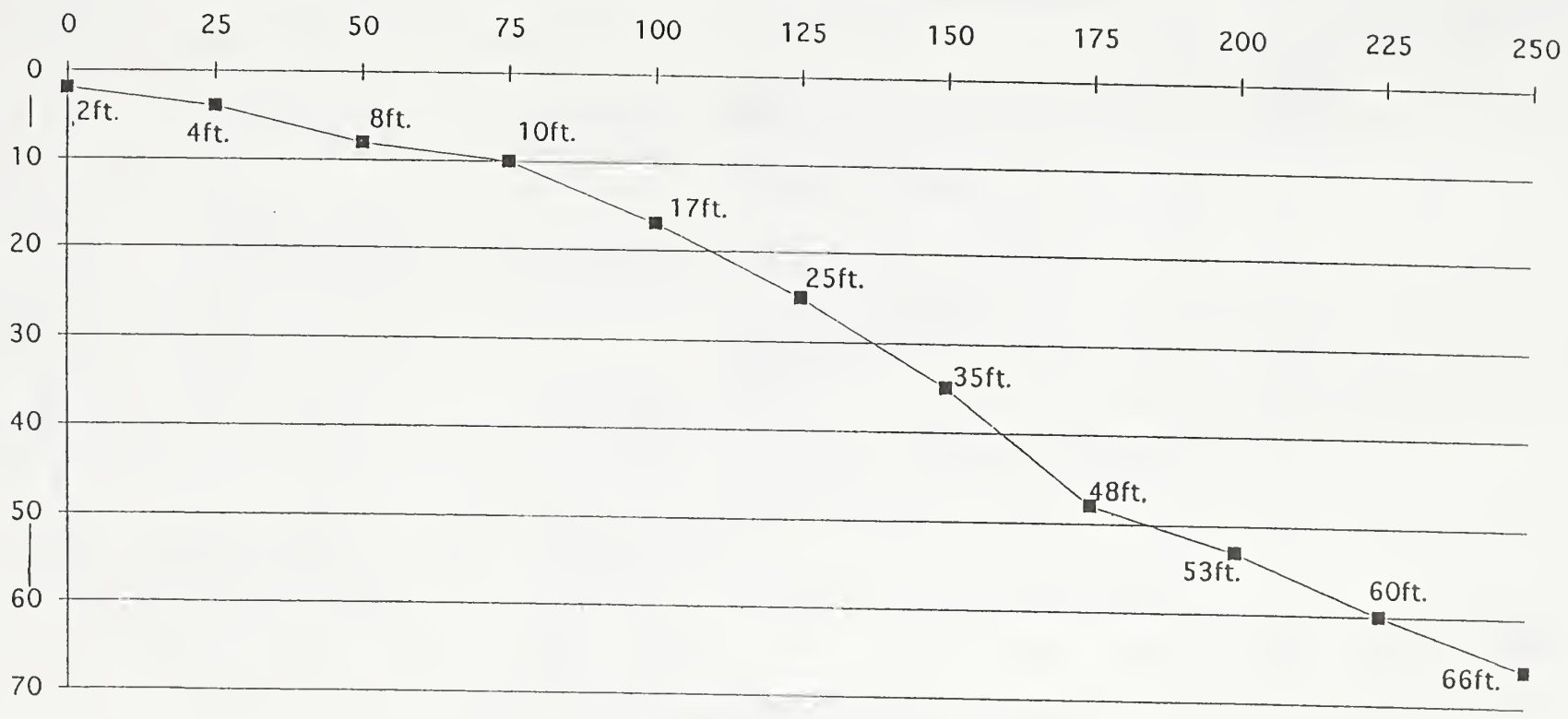
The diving began at approximately 10:30 am. Low tide was at 11:13 am. 1.1ft. High tide was at 5:36 pm. 15ft. All depths shown have been converted to MLW.

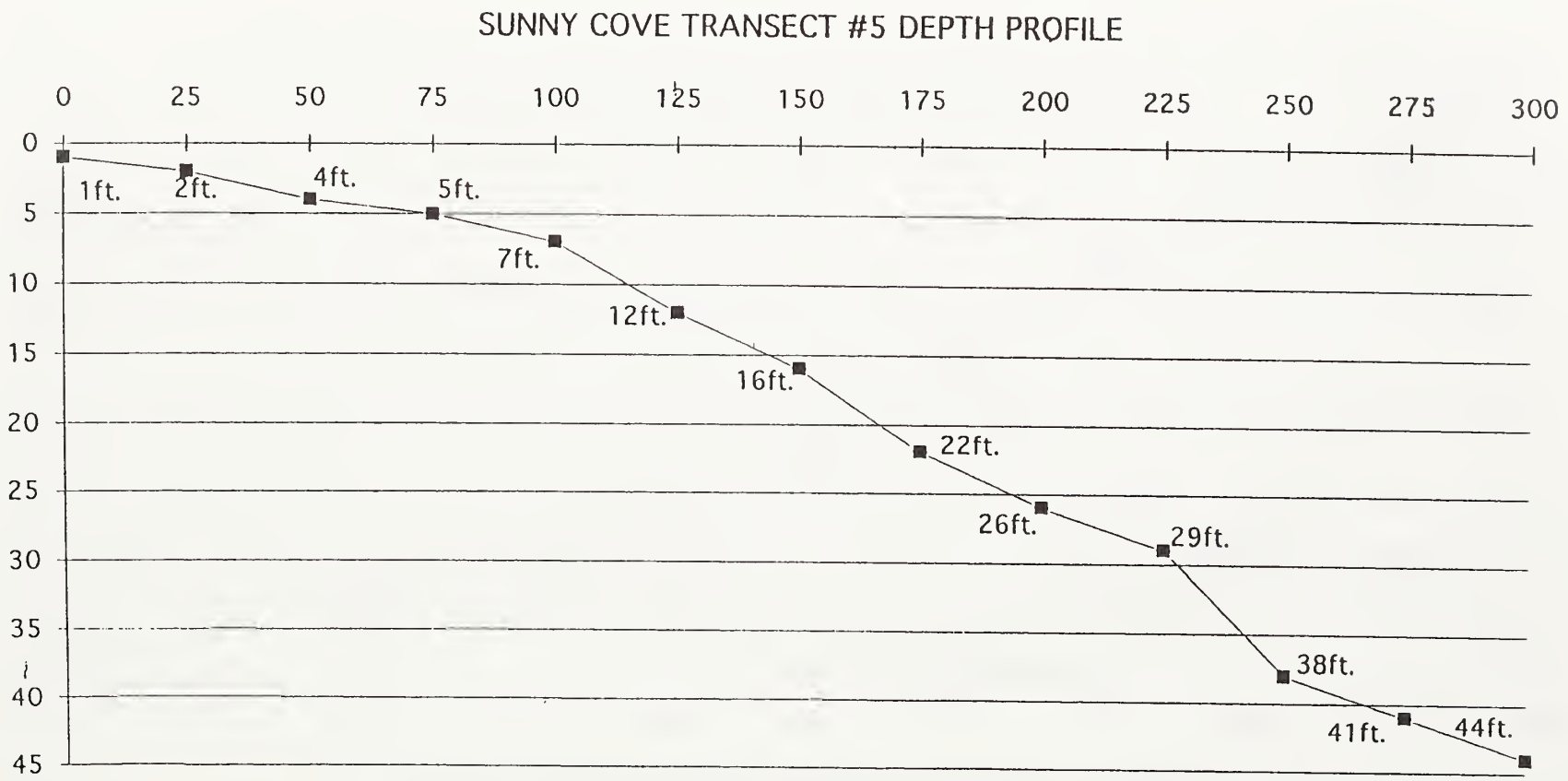
A 100 foot area on each side of transects 1 and 5 was swam to ensure no sensitive habitat was close by.


SUNNY COVE TRANSECT #1 DEPTH PROFILE 7/21/96
0
25
50
75
100
125
150
175
200
225
250
275
300
0
5
10
15
20
25
30
35
1ft.
3ft.
8ft.
9ft.
14ft.
15ft.
18ft.
21ft.
23ft.
26ft.
28ft.
31ft.
34ft.


SUNNY COVE TRANSECT #2 DEPTH PROFILE 7/21/96
0
25
50
75
100
125
150
175
200
225
250
275
300
0
10
20
30
40
50
60
70
1ft.
3ft.
6ft.
10ft.
14ft.
18ft.
25ft.
32ft.
40ft.
47ft.
53ft.
60ft.
65ft.


SUNNY COVE TRANSECT #3 DEPTH PROFILE 7/21/96
0
25
50
75
100
125
150
175
200
225
250
0
10
20
30
40
50
60
70
1ft.
3ft.
7ft.
11ft.
19ft.
25ft.
35ft.
45ft.
51ft.
56ft.
64ft.


SUNNY COVE TRANSECT #4 DEPTH PROFILE 7/21/96
0
25
50
75
100
125
150
175
200
225
250
0
10
20
30
40
50
60
70
2ft.
4ft.
8ft.
10ft.
17ft.
25ft.
35ft.
48ft.
53ft.
60ft.
66ft.


SUNNY COVE TRANSECT #5 DEPTH PROFILE
0
25
50
75
100
125
150
175
200
225
250
275
300
0
5
10
15
20
25
30
35
40
45
1ft.
2ft.
4ft.
5ft.
7ft.
12ft.
16ft.
22ft.
26ft.
29ft.
38ft.
41ft.
44ft.

7/21/96

SUNNY COVE TRANSECT #1

COMPASS DIRECTION 280

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	1FT.BY 1FT. AREA	NUMBER
300	34	COBBLE,SAND,SHELLS(MIXED)	LAMANARIA 75%	COCKLE(PROBABLY CLINOCARDIUM NUTTALLII)	2		
				CUCUMBER(PARASTICHOPUS CALIFORNICUS)	3		
275	31	COBBLE,SAND,SHELLS	LAMANARIA 75%	COCKLE	4		
				CUCUMBER	4		
250	28	COBBLE,SAND,SHELLS	LAMANARIA 75%	CANDY CANE STAR(ORTHASTERIAS KOEHLERI)	1		
225	26	COBBLE,SAND,SHELLS	LAMANARIA 100%	CUCUMBER	1		
				CRESCENT GUNNEL(PHOLIS LAETA)	1		
200	23	COBBLE,SAND,SHELLS	LAMANARIA 100%	HAIRY TRITON(FUSITRITON OREGONENSIS)	1		
175	21	COBBLE,SAND,SHELLS	LAMANARIA 100%	NO LIFE			
150	18	COBBLE,SAND,SHELLS	LAMANARIA 100%	SEA STAR(PYCNOPODIA HELANTHOIDES)	1		
				CRESCENT GUNNEL	1		
125	15	COBBLE,SAND,SHELLS	LAMANARIA 100%	CUCUMBER	1		
100	14	COBBLE,SAND,SHELLS	LAMANARIA 100%	SEA STAR	1		
				KELP GREENLING(HEXAGRAMMOS DECAGRAMMUS)	1		
75	9	LG ROCK,BOULDERS	LAMANARIA 100%	CRESCENT GUNNEL	1		
			CORALLINE ALGAE 25%				
			GREEN ALGAE 10%				
50	8	LG ROCK,BOULDERS	LAMANARIA 50%	TIDEPOOL SCULPIN(OLIGOCOTTUS MACULOSUS)	1		
			GREEN ALGAE 10%				
			CORALLINE ALGAE 10%				
25	3	LG ROCK	LAMANARIA 25%	CRESCENT GUNNEL	1		
			FUCUS 10%	GREEN URCHIN(SEE BELOW)			
			CORALLINE ALGAE 10%	(STRONGYLOCENTROTUS DROEBACHIENSIS)	10	SM SNAIL ?	5
			BROWN ALGAE 10%				
0	1	LG ROCK	LAMANARIA 25%	GREEN URCHIN	25	SM SNAIL ?	5
			FUCUS 25%			LIMPETS	2

7/21/96 SUNNY COVE TRANSECT #2 COMPASS DIRECTION 330

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	1FT.BY 1FT. AREA	NUMBER
300	65	GRAVEL,SHELLS,SAND	N/A	CUCUMBER(PARASTYCHOPUS CALIFORNICUS)	2		
				GUMBOOT CHITON(CRYPTOCHITON STELLERI)	1		
275	60	GRAVEL,SHELLS,SAND	N/A	CUCUMBER	1		
250	53	GRAVEL,SHELLS,SAND	N/A	NO LIFE			
225	47	GRAVEL,SAND	LAMANARIA 10%	NO LIFE			
200	40	GRAVEL,SAND	LAMANARIA 50%	CLAM ?	6		
175	32	ROCK,STEEP	LAMANARIA 100%	CRESCENT GUNNEL(PHOLIS LAETA)	1		
				SEA STAR(PYCNOPODIA HELANTHOIDES)	2		
				GREY COD(GADUS MACROCEPHALUS)	2		
150	25	ROCK,STEEP	LAMANARIA 100%	NO LIFE			
125	18	ROCK,STEEP	LAMANARIA 100%	CUCUMBER	2		
				ORANGE HERMIT CRAB(ELLASSOCHIRUS GILLI)	1		
100	14	ROCK,SAND	LAMANARIA 100%	SEA STAR	1		
			GREEN ALGAE 25%				
			BROWN ALGAE 10%				
75	10	ROCK,SAND	LAMANARIA 100%	CRESCENT GUNNEL	1		
			GREEN ALGAE 10%	ROCK SOLE(LEPIDOPSETTA BILINEATA)	1		
			CORALLINE ALGAE 10%				
50	6	ROCK	LAMANARIA 100%	CRESCENT GUNNEL	1	SNAILS ?	5
			CORALLINE ALGAE 10%	ORANGE HERMIT CRAB	2		
25	3	ROCK	LAMANARIA 100%	GREEN URCHIN(SEE BELOW)			
			CORALLINE ALGAE 10%	(STRONGYLOCENTROTUS DROEBACHIENSIS)	20		
			BROWN ALGAE 10%				
0	1	ROCK	LAMANARIA 50%	GREEN URCHIN	15		
			FUCUS 25%				

7/21/96

SUNNY COVE TRANSECT #3

COMPASS DIRECTION 360

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	1FT.BY 1FT. AREA	NUMBER
250	64	GRAVEL,SAND,HORSE MUSSEL SHELLS	N/A	CUCUMBER(PARASTICHOPUS CALIFORNICUS)	2		
				SEA STAR(PYCNOPODIA HELANTHOIDES)	1		
225	56	GRAVEL,SAND,HORSE MUSSEL SHELLS	N/A	CLAM ?	3		
				CUCUMBER	2		
				GUMBOOT CHITON(CRYPTOCHITON STELLERI)	1		
200	51	GRAVEL,SAND	LAMANARIA 10%	CLAM ?	3		
175	45	GRAVEL,SAND	LAMANARIA 25%	NO LIFE			
150	35	ROCK,STEEP	LAMANARIA 50%	ORANGE CUCUMBER(CUCMARIA MINIATA)	2		
125	25	ROCK,STEEP	LAMANARIA 100%	CUCUMBER	2		
				CRESCENT GUNNEL(PHOLIS LAETA)	1		
				KELP GREENLING(HEXAGRAMMOS DECAGRAMMUS)	1		
100	19	ROCK	LAMANARIA 100%	CUCUMBER	1		
				HAIRY HERMIT CRAB(PAGURUS HIRSUTIUSCULUS)	2		
				WRINKLED DOG WHELK(THAIS LAMELLOSA)	1		
75	11	SAND OVER ROCK	LAMANARIA 100%	HORSE MUSSEL(MODIOLUS MODIOLUS)	6		
50	7	SAND OVER ROCK	LAMANARIA 100%	HORSE MUSSEL	3		
			FUCUS 10%	CUCUMBER	1		
			GREEN ALGAE 10%	SEA STAR	1		
25	3	ROCK	LAMANARIA 100%	SEA STAR	1		
				CRESCENT GUNNEL	1		
				CUCUMBER	1		
				GREEN URCHIN(SEE BELOW)			
				STRONGYLOCENTROTUS DROEGACHIENSIS)	6	SNAIL ?	6
						LIMPET	3
0	1	ROCK	LAMANARIA 25%	GREEN URCHIN	6		
			GREEN ALGAE 10%			SNAIL ?	4
			CORALLINE ALGAE 10%			LIMPET	3

7/21/96

SUNNY COVE TRANSECT #4

COMPASS DIRECTION 360

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	1FT.BY 1FT. AREA	NUMBER
250	66	GRAVEL,SAND,HORSE MUSSEL SHELLS	N/A	ROCK SOLE(LEPIDOPSETTA BILINEATA)	1		
				CUCUMBER(PARASTYCHOPUS CALIFORNICUS)	2		
225	60	GRAVEL,SAND,HORSE MUSSEL SHELLS	N/A	CUCUMBER	2		
				PINK SCALLOP(CHLAMYS HASTATA HERICIA)	2		
200	53	GRAVEL,SAND,HORSE MUSSEL SHELLS	LAMANARIA 10%	NO LIFE			
175	48	GRAVEL,SAND	LAMANARIA 50%	SEA STAR(PYCNOPODIA HELANTHOIDES)	1		
				CUCUMBER	2		
150	35	COBBLE,SAND	LAMANARIA 00%	ORANGE HERMIT CRAB(ELLASSOCHIRUS GILLI)	1		
				SEA STAR	2		
				KELP CRAB(PUGETTIA PRODUCTA)	1		
125	25	ROCK,STEEP	LAMANARIA 100%	SEA STAR	1		
				CUCUMBER	1		
100	17	ROCK,STEEP	LAMANARIA 100%	SEA STAR	1		
				CANDY CANE STAR(ORTHASTERIAS KOEHLERI)	1		
75	10	SAND OVER ROCK	LAMANARIA 100%	SEA STAR	1		
			GREEN ALGAE 10%	HORSE MUSSEL(MIDIOLUS MODIOLUS)	6		
			BROWN ALGAE 10%	HERMIT CRAB ?	1		
			FUCUS 10%				
50	8	ROCK	LAMANARIA 100%	SEA STAR	1	SNAIL ?	6
			BROWN ALGAE 10%	GREEN URCHIN(SEE BELOW)		PAGURID HERMIT CRABS	10
			GREEN ALGAE 10%	(STRONGYLOCENTROTUS DROEBACHIENSIS)	6	CHITON	2
						LIMPET	2
25	4	ROCK	LAMANARIA 50%	CUCUMBER	1	SNAIL ?	5
			FUCUS 10%	CRESCENT GUNNEL(PHOLIS LAETA)	2	LIMPET	3
			BROWN ALGAE 10%	GREEN URCHIN	6	PAGURID HERMIT CRABS	4
			GREEN ALGAE 10%				
0	2	ROCK	LAMANARIA 50%	GREEN URCHIN	4	LIMPET	2
			CORALLINE ALGAE 10%			PAGURID HERMIT CRABS	4

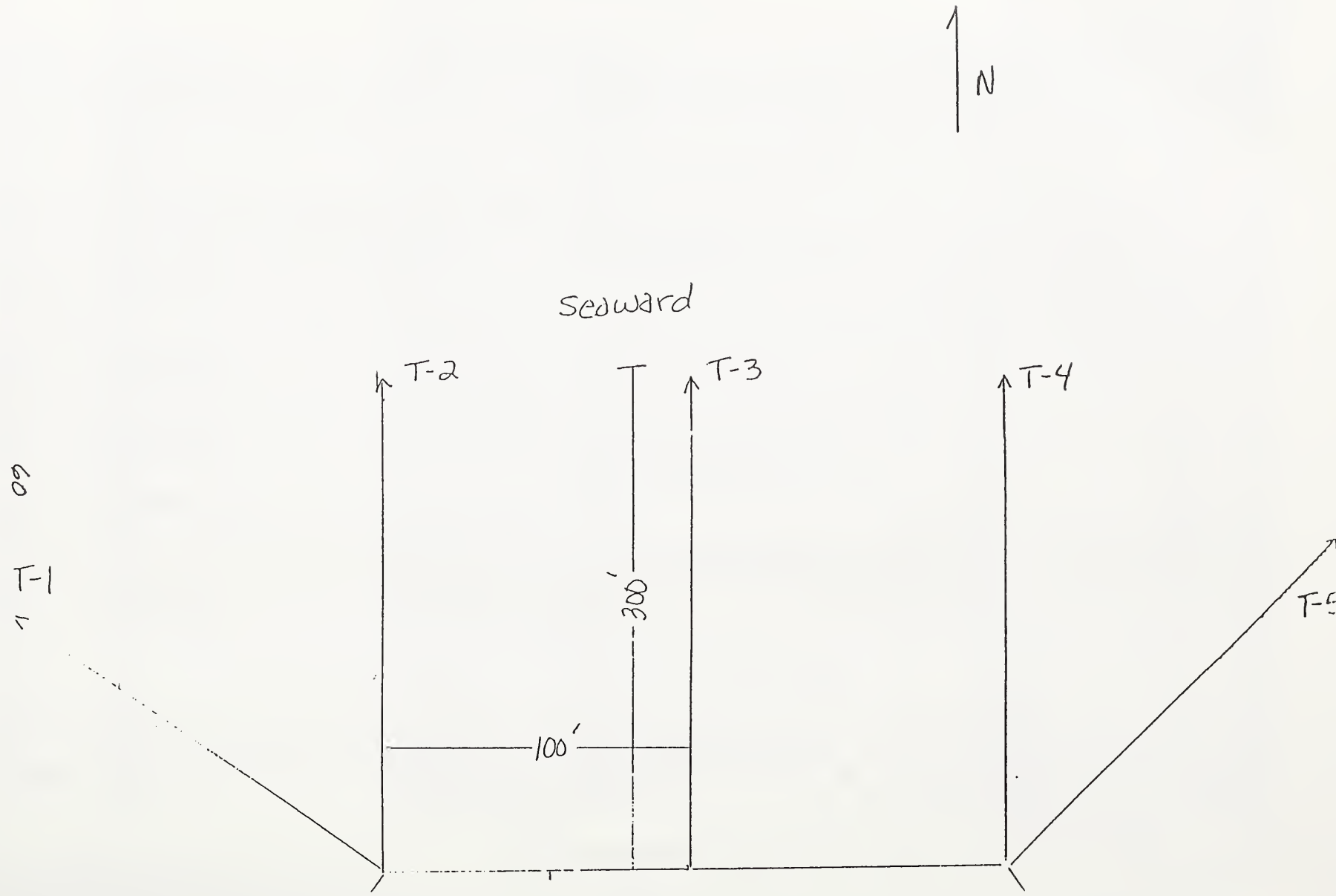
7/21/96

SUNNY COVE TRANSECT #5

COMPASS DIRECTION 030

STATION	DEPTH FT.	BOTTOM TYPE	PLANTS	ANIMALS	NUMBER	1FT.BY 1FT. AREA	NUMBER
300	44	SAND,GRAVEL,HORSE MUSSEL SHELLS	LAMANARIA 10%	SEA STAR(PYCNOPODIA HELANTHOIDES)	1		
				DUNGENESS CRAB(CANCER MAGISTER)	1		
275	41	SAND,GRAVEL,HORSE MUSSEL SHELLS	LAMANARIA 10%	SEA STAR	1		
				ROCK SOLE(LEPIDOPSETTA BILINEATA)	1		
250	38	SAND,GRAVEL	LAMANARIA 10%	NO LIFE			
225	29	SAND,GRAVEL	LAMANARIA 50%	SEA STAR	1		
				CANDY CANE STAR(ORTHASTERIAS KOEHLERI)	1		
				HERMIT CRAB ?	2		
200	26	SAND,GRAVEL	LAMANARIA 100%	SEA STAR	1		
				CRESCENT GUNNEL(PHOLIS LAETA)	2		
175	22	SAND,COBBLE	LAMANARIA 100%	WOLF EEL(ANARRICHTHYS OCELLATUS)	1		
			GREEN ALGAE 10%	KELP GREENLING(HEXAGRAMMOS DECAGRAMMUS)	1		
			BROWN ALGAE 10%				
150	16	LG ROCK,STEEP	LAMANARIA 100%	SEA STAR	1		
			GREEN ALGAE 10%	KELP GREENLING	1		
			BROWN ALGAE 10%				
125	12	LG ROCK,STEEP	LAMANARIA 100%	HERMIT CRAB ?	1		
			FUCUS 10%	TIDEPOOL SCULPIN(OLIGOCOTTUS MACULOSUS)	1		
			GREEN ALGAE 10%				
100	7	ROCK,NOT STEEP	LAMANARIA 100%	GREEN URCHIN(SEE BELOW)			
			FUCUS 10%	(STRONGYLOCENTROTUS DROEBACHIENSIS)	6		
			CORALLINE ALGAE 10%	SEA STAR	2		
				CUCUMBER	1		
75	5	ROCK	LAMANARIA 100%	SEA STAR	1	PAGURID HERMIT CRABS	10
			FUCUS 10%	GREEN URCHIN	10	LIMPETS	5
			CORALLINE ALGAE 10%				
50	4	ROCK	LAMANARIA 50%	GREEN URCHIN	15	PAGURID HERMIT CRAB	10
			FUCUS 25%			LIMPET	2
						SNAIL ?	4
25	2	ROCK	LAMANARIA 10%	CRESCENT GUNNEL	1	SNAIL ?	6
			FUCUS 10%				
0	1	ROCK	FUCUS 10%	NO LIFE		SNAIL ?	2
						LIMPET	3

Sunny cove transect layout.



Appendix L

Memorandum of Understanding Between the City of Tenakee Springs and the USDA Forest Service for the Short Term Use of Tenakee Springs' Tidelands at Sunshine Cove

MEMORANDUM OF UNDERSTANDING

BETWEEN THE CITY OF TENAKEE SPRINGS AND

THE USDA FOREST SERVICE

FOR THE SHORT TERM USE OF

TENAKEE SPRINGS' TIDELANDS AT SUNNY COVE

NOVEMBER 12, 1996

This Memorandum of Understanding ("MOU") made and entered into by and between the City of Tenakee Springs, P. O. Box 52, Tenakee Springs, Alaska 99841 ("Tenakee Springs") and the USDA Forest Service, Region 10, P. O. Box 21628, Juneau, Alaska 99802 ("Forest Service"), provides the terms under which Tenakee Springs will make available to the Forest Service, and to the Timber Sale Purchasers, Contractors and Assigns of the Forest Service, the use of the tidelands at Sunny Cove, which are owned by Tenakee Springs.

WITNESS:

WHEREAS, the Forest Service may need to secure access across tidelands owned by Tenakee Springs to provide for the development or use of National Forest timber resources, and where the analysis of the site-specific situation by the Forest Service indicates that access for the short term is appropriate;

NOW, THEREFORE, Tenakee Springs has determined that it is in its interest, and the Forest Service has determined that it is in the public's best interest, to establish this MOU for the short term use of Tenakee Springs' tidelands at Sunny Cove.

I. DEFINITIONS

A. Tidelands - The tidelands owned by Tenakee Springs, including the existing fill, located at Sunny Cove, further described as State of Alaska Tidelands Patent No. 321, containing 30.198 acres of land in Tracts A and B of Alaska Tidelands Survey 1050, Tenakee Inlet, Alaska, within unsurveyed Sec. 23, T. 47 S., R. 63 E., CRM (hereafter the tidelands).

B. Indian River Project Area - The geographical limits shown on Attachment A to this MOU.

C. Forest Service - The USDA Forest Service, including its employees and agents, but not a Timber Sale Purchaser, Contractors and Assigns, or other third parties under contract with the Forest Service.

D. Tenakee Springs - The City of Tenakee Springs, including its employees and agents.

E. Parties - Tenakee Springs and the Forest Service.

F. Contractors and Assigns - Any person or entity, including its employees, agents, contractors, successors-in-interest, and assigns, awarded a Forest Service contract under the Federal Procurement Act, or sub-contractors to perform under a Forest Service contract, to undertake work related to timber sale preparation, administrative and/or silvicultural management on National Forest lands, which work may necessitate the use of the tidelands.

G. Log Transfer Facility - The improvements located on the tidelands necessary to transfer logs to marine waters or onto barges or ships.

H. Timber Sale Contract - A contract between the United States and a Timber Sale Purchaser that sets the terms and conditions for the harvest, transportation, and millage of National Forest timber. The Timber Sale Contract is administered by a Forest Service Contracting Officer and Timber Sale Administrator.

I. Timber Sale Purchaser - The person(s) or entity/entities awarded a Timber Sale Contract, and the designated parties responsible for performance of the work and payments included in the Timber Sale Contract, including its employees, agents, contractors, successors-in-interest and assigns.

II. UNDERSTANDING OF THE PARTIES FOR USE OF THE TIDELANDS

A. Subject to the provisions of this MOU, Tenakee Springs agrees to make the tidelands available to the Forest Service, Timber Sale Purchasers, or Contractors and Assigns, for

the sole purpose of providing access for timber harvest administration, hauling logs across the tidelands; or transfer of logs to marine waters and temporary storage in the tidelands. The right to use the tidelands granted by this MOU does not imply Tenakee Springs is granting any right of public access.

B. Rates for the use of occupancy of the tidelands will be as outlined in Section III of this MOU.

C. The use of the tidelands is limited to the Forest Service, Timber Sale Purchasers, or its Contractors and Assigns. Use of the tidelands is authorized only for the timber harvest proposed in the Environmental Impact Statement and Record of Decision currently being prepared for the Indian River Project Area, and only for timber harvest within the geographical limits of the Indian River Project Area, as those limits are shown in Attachment A to this MOU. For the duration of this MOU, no road connections between the log transfer facility and road systems other than the system within the geographical limits of the Indian River Project Area will be allowed. Such use and access does not imply, and does not constitute any long term right or interest in the tidelands. The Forest Service will allow public (including Tenakee Springs) access to the tidelands that does not unduly interfere with the use of the facility for the purposes authorized by this MOU. Use of the tidelands for logging camps, either temporary or permanent, is not authorized. The Forest Service shall not authorize, advocate or allow logging camps within the city limits of Tenakee Springs or within the Indian River watershed. A caretaker/watchman residence near the log transfer facility to protect the tidelands and any improvements from vandalism and theft is authorized by Tenakee Springs should the Forest Service or its Timber Sale Purchaser determine it to be necessary. For the duration of this MOU, the Forest Service agrees that it will not, directly or indirectly, develop or use, or permit the

development or use, of alternative log transfer facility sites in connection with the Indian River Project, including but not limited to sites at Ten Mile Creek, or at other locations in Sunny Cove.

D. Blasting operations conducted near the log transfer facility, or the trail crossing the road near the log transfer facility shall be carried out with the use of a sequential timer, and only occur between the hours of 8 AM and 5 PM. Prior notice of blasting activities shall be posted at a conspicuous place in Tenakee Springs. The Forest Service will require its Timber Sale Purchasers, Contractors and Assigns to employ guards or take other necessary measures to ensure the safety of the public in the area of blasting activities.

E. The trail east of Tenakee Springs within the road right of way will be properly maintained and protected by the Forest Service against impacts that may render it impassable or difficult to use as a result of logging activities. The trail shall be maintained at its current condition for the term of the MOU, although the Forest Service may temporarily close or relocate the trail where public safety necessitates such action.

F. Vehicles traveling within 0.25 miles of the log transfer facility and trail east of Tenakee Springs will be limited to a maximum speed of 10 miles per hour, to ensure the safety of pedestrians using the area.

G. Vehicles and other machinery operating near the log transfer facility will be muffled so as to comply with applicable federal and state standards for noise control, and otherwise to the fullest extent reasonably possible to limit noise.

H. Use of the tidelands for helicopter operations will be limited to occasional use for emergency or other non-recurring uses. The tidelands will not be used for helicopter delivery of timber, or for routine fueling of helicopters. While the Forest Service has no authority to direct aircraft during flight, the Forest Service will encourage Timber Sale Purchasers, and Contractors

and Assigns to route helicopter flights over the Indian River road corridor as much as possible, keeping over flights of residences of Tenakee Springs to the minimum necessary.

III. TIDELANDS USE RATES

A. Tidelands use rates and fees charges for the term of this MOU are as follows:

1. Use rate

The use rate for the tidelands shall be: $1.50 per thousand board feet (mbf) through calendar year 1997, then increase $0.10/mbf each year thereafter. The amount of this use fee shall be determined by multiplying the stated rate by the estimated volume of timber to be processed through the log transfer facility, as determined by the Forest Service and as provided in any Timber Sale Contracts for the harvest of timber within the Indian River Project area.

2. Quarterly fee

An additional quarterly fee of $1,250 per calendar quarter shall also be paid by each Timber Sale Purchaser, prior to the Timber Sale Purchaser's use or occupancy of the tidelands. Such fee shall be paid in full for any use or occupancy occurring within a quarter, regardless of its duration.

IV. SCHEDULE AND RESPONSIBILITY FOR PAYMENTS

A. Use or Occupancy

1. The timber in the Indian River Project Area will be sold pursuant to a standard Forest Service Timber Sale Contract on a per thousand board foot Scribner scale net saw log plus net utility basis by payment unit. Payment to Tenakee Springs by the Timber Sale Purchaser shall be made on an identical per thousand board foot Scribner scale net saw log plus net utility basis by payment unit. Payment shall be calculated in accordance with Section III.A.1 above. The Scribner log rule is a measuring standard used by the forest products industry to scale logs.

It is defined in the Forest Service Log Scaling Handbook 2409.11 and Region 10 Supplement No. 2409.11 - 92-1.

2. The Timber Sale Contract shall require the Timber Sale Purchaser to make payment for use or occupancy of the tidelands to Tenakee Springs on a payment unit by payment unit basis as described in section IV.A.1. Payment shall be made prior to any timber being cut in the payment unit. In addition to other remedies that may be provided herein, payments made after the date specified above may be charged a late fee by Tenakee Springs. The late fee will be based upon an 18 percent annual interest charged on the outstanding balance and shall be paid by the Timber Sale Purchaser. The Timber Sale Purchaser shall be required to post a payment bond with a value of $10,000 (this figure was derived based on an estimate of fees for use of the tidelands for six months).

3. The Timber Sale Contract shall require the Timber Sale Purchaser to pay the quarterly fee for the use or occupancy of the tidelands as described in Section III.A.2.

4. All payments due and payable to Tenakee Springs pursuant to this MOU shall be paid by the Timber Sale Purchaser. The Forest Service shall comply with all terms and conditions of this MOU and shall require its Timber Sale Purchaser or Contractors and Assigns to comply with all terms and conditions of this MOU that are applicable to them. The Forest Service shall be responsible for administering its Timber Sale Contracts. However, the Forest Service does not have the authority to pay any amounts that may be due to Tenakee Springs under III.A above, and therefore is not responsible for such payments. To the extent authorized by the Timber Sale Contract or other appropriate Forest Service contract, the Forest Service shall seek to ensure that payments due to Tenakee Springs pursuant to the MOU are made by the Timber Sale Purchaser, within the time frames authorized by this MOU and the Timber Sale Contract.

5. Tenakee Springs will notify the Forest Service immediately of the amount and date of payments received from the Timber Sale Purchaser.

V. RESPONSIBILITIES ASSOCIATED WITH USE OF THE TIDELANDS

A. This MOU is not intended to affect any liability of the Forest Service that may arise under the Federal Tort Claims Act.

B. The Forest Service, its Timber Sale Purchasers, or Contractors and Assigns shall comply with all applicable environmental laws and regulations. Liability for any environmental or water quality damage that is caused by the Forest Service, its Timber Sale Purchasers or Contractors and Assigns shall be the responsibility of the Timber Sale Purchasers, Contractors and Assigns, and the Forest Service to the extent authorized by law.

C. The Forest Service will require of the Timber Sale Purchaser, or Contractors and Assigns, the following minimum insurance for use of the tidelands:

i. As required by law, insurance in at least the required statutory amounts covering claims under Worker's Compensation, the Longshoremen and Harbor Workers Act, disability benefits and other similar employee benefits acts, including employer's liability insurance and maritime employer's liability insurance with limits of not less than $2,000,000.00;

ii. Comprehensive general liability insurance covering bodily injury, death, and property damage with a combined single limit of not less than $5,000,000.00 completed operations and contractual liability; and

iii. Automobile liability insurance for Timber Sale Purchaser owned, leased, hired or non-owned vehicles, for bodily injury, death, and property damage with a combined single limit of not less than $5,000,000.00 covering all vehicles and equipment utilized in connection with this Agreement.

iv. In the event Timber Sale Purchaser acquires or uses watercraft vessels and aircraft in conjunction with its operations under this Memorandum of Understanding, it shall obtain liability and indemnity insurance with a combined single limit of not less than $2,000,000.00.

v. Tenakee Springs shall be specifically named as an additional insured on policies required by this provision.

D. For the duration of this MOU, the Forest Service agrees that it, its Timber Sale Purchaser, or Contractors and Assigns will be responsible for maintaining all applicable permits and licenses, conducting all monitoring dives, making reports, and carrying out any other processes associated with governmental authorization required by law with respect to use of the tidelands.

E. The Forest Service Timber Sale Purchasers or Contractors and Assigns shall pay all applicable taxes and assessments that may be due arising from the use of the tidelands.

F. The Forest Service or its Timber Sale Purchasers may reconstruct the existing log bulkhead at Sunny Cove. The reconstructed facility will be either a log bulkhead, smaller in size and scope than the existing log bulkhead, or a drive down ramp with steel rails at a maximum 12 percent grade. Other improvements may include construction of a boat and airplane float and ramp, an equipment off loading ramp, piles or dolphins for anchoring barges, floating booms and rafting pens. Costs for reconstructing the bulkhead, and constructing the other improvements will be borne by the Forest Service or its Timber Sale Purchaser. The Forest Service or its Timber Sale Purchaser will be responsible for maintaining the tidelands, and any improvements made thereto.

G. The Forest Service's Timber Sale Purchaser or Contractors and Assigns shall, within 60 days after termination of this MOU, remove all their improvements and chattels located at the tidelands, excluding the bulkhead and fill, unless otherwise agreed to by Tenakee

Springs. The fill and all bulkheads on the tidelands remain the property of Tenakee Springs. Following such removal, the Forest Service, its Timber Sale Purchasers and Contractors and Assigns shall leave the tidelands in a safe and clean condition. Tenakee Springs may, at its discretion, extend the time for removal of improvements and chattel where undue hardship is demonstrated. A joint inspection report of the tidelands shall be prepared by the parties prior to any use or occupancy of the tidelands authorized by this MOU. A joint inspection of the tidelands shall also be performed by the parties before termination of this MOU to insure compliance with this clause.

VI. PERIODIC REVIEW

A. The Forest Service or its Timber Sale Purchaser, Contractors and Assigns shall annually inform Tenakee Springs by thirty days' prior written notice of the intent to begin logging operations. Such notice shall include the annual operating plan, if any, and a schedule of any work proposed to maintain the condition of the log transfer facility and the tidelands.

B. Either party may request a meeting at any time to review this MOU and make such changes as shall be mutually agreed upon.

VII. TERMINATION

The Forest Service or Tenakee Springs may terminate this MOU by giving 60 days prior written notice to the other party. Provided, however, that so long as the Forest Service, its Timber Sale Purchasers, and Contractors and Assigns comply with the terms of this MOU, Tenakee Springs shall not terminate this MOU prior to December 31, 2002, on which date any rights granted by Tenakee Springs under this MOU shall expire automatically; and provided further, that if a Timber Sale Contract is in progress on December 31, 2002, such Timber Sale Contract will be allowed to continue to completion (so long as the Forest Service, its Timber Sale Purchasers, Contractors and Assigns comply with the terms of this MOU), but in no event later

than December 31, 2003, at which time (i.e., the earlier of completion or December 31, 2003) any rights granted by Tenakee Springs under this MOU shall expire automatically.

VIII. MISCELLANEOUS

A. The provisions of this MOU apply only to the geographical limits shown on Attachment A to this MOU, and are effective only for the duration of the timber harvest and other project activities reflected in the Final Environmental Impact Statement and Record of Decision for the current Indian River Project environmental analysis (Notice of Intent published in the Federal Register on November 1, 1995), but in no event beyond the time period specified in VII above; provided, however, that this MOU may be extended or modified by mutual agreement of the parties.

B. Nothing contained in this MOU shall be construed as obligating the federal government or as involving the United States in any obligation for future payment of money in excess of appropriations authorized by law and administratively available.

C. No member or delegate to the Congress, or Resident Commissioner, shall be admitted to any share or part of this agreement or to any benefits that may arise therefrom, unless it is made with a corporation for its general benefit.

D. In performance of work described in this MOU, the parties agree to comply with the provisions for Equal Opportunity as set out in FAR 52.222-26 (Apr. 1984).

E. Notices. All Notices required under this MOU shall be made by certified mail, postage prepaid, to the parties at the following addresses:

To Tenakee Springs:	City of Tenakee Springs P. O. Box 52 Tenakee Springs, Alaska 99841
To the Forest Service:	USDA Forest Service Sitka Ranger District 201 Katlian Street, Suite 109 Sitka, Alaska 99835

F. This MOU shall not become effective and binding upon Tenakee Springs until 30 days after the ordinance authorizing the use in this MOU is ratified by a majority of qualified voters, voting on the question at a Special Election to be held in January or March 1997. Tenakee Springs shall provide the Forest Service with copies of the city council's resolution approving this MOU and the ordinance authorizing the use in this MOU, as ratified by the voters and signed by the Mayor of Tenakee Springs.

G. Any use of the tidelands by the Forest Service, its employees and agents, or the Forest Service's Timber Sale Purchaser or Contractors and Assigns is subject to the terms and conditions of this MOU.

H. This MOU shall not be construed to limit the parties, their employees or agents from participating in any way, directly or indirectly, in the environmental analysis process for the Indian River Project, or expressing opinions in any manner to any persons in any forum on the merits of that Project or this MOU, and such participation or expressions shall not be deemed a breach of this MOU.

DATED this 21 day of November, 1996.

Louis Heins
Mayor
City of Tenakee Springs

DATED this 15th day of November, 1996.

for Phil Janik
Regional Forester
Region 10

, DRF-NR

City of Tenakee Springs

ORDINANCE 97-06

In the Council
October 24, 1996

Introduced by the
Council President

AN ORDINANCE FOR THE CITY OF TENAKEE SPRINGS, ALASKA, AUTHORIZING THE SHORT TERM USE OF ATS 1050 TRACTS A AND B [SUNNY COVE TIDELANDS] BY THE USDA FOREST SERVICE FOR USE AS A LOG TRANSFER FACILITY, AND SETTING THE TERMS AND CONDITIONS THEREOF

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF TENAKEE SPRINGS, ALASKA:

CLASSIFICATION: This Ordinance is of a specific and limited nature and shall not become a part of the City Code.

SEVERABILITY : If any provision of this Ordinance or any application thereof to any person or circumstance is held invalid, the remainder of this Ordinance and its application shall not be affected thereby.

EFFECTIVE DATE: This Ordinance becomes effective thirty days following ratification by the voters at the election designated by the City Council.

ADOPTED 7 YES THIS 21ST DAY OF NOVEMBER 1996

RECEIVED BY
SITKA RANGER DISTRICT

DEC 01 '96

Louis S. Heins
City Council President
ex officio MAYOR

ATTEST:

Janice J. Eagle
City Clerk

	FYI	ACT
District Ranger		
Timber		
Silviculture		
F & W		
R & L Minerals		
Compound		
Business		
Planning		
File		

IR 443 5j
96 Nov 21

00.00.010 **Statutory Authority.** This Ordinance is authorized by Alaska Statutes 29.35.090 and Tenakee Springs Municipal Code Title 08.

00.00.020 **Statutory Procedures.** A.. State of Alaska Patent Tidelands No. 321 grants to the City of Tenakee Springs Tracts "A" and "B" of Alaska Tidelands Survey No. 1050, Tenakee Inlet, Alaska, within unsurveyed section 23, Township 47 South, Range 63 East, Copper River Meridian.

B. Pursuant to Alaska Statute 29.35.090 and Tenakee Springs Municipal Code (TSMC) 08.01, the Tenakee Springs City Council adopted Resolution 97-09 of findings and authorization for the preparation of the Short Term Use of Alaska Tidelands Survey (ATS) Tracts A and B [Sunny Cove Tidelands] by the USDA Forest Service for a Log Transfer Facility.

C. Pursuant to TSMC 08.01.040, this disposal is a specific, limited and non-competitive use by another government, specifically a Short Term Use by the USDA Forest Service for a Log Transfer Facility, until December 31, 2002 and further allows timber harvest in progress on December 31, 2002 and under timber sale contract, to continue to completion.

00.00.030 **Terms of Payment.** A. The Terms of Payment are as contained in Section III of the Memorandum of Understanding between the City of Tenakee Springs and the USDA Forest Service for the Short Term Use of Tenakee Springs Tidelands, approved by Resolution 97-11, and are specifically as follows:

1. The Use Rate is: $1.50 per 1000 board feet through calendar year 1997, and then increases $0.10 per 1000 board feet each year there after. The amount of the user fee shall be determined by multiplying the stated rate by the estimated volume of timber to be processed through the log transfer facility.

2. A quarterly fee of $1,250 per calendar quarter shall also be paid by the each timber sale purchaser, prior to the timber sale purchaser's use or occupancy of the tidelands. Such fee shall be paid in full for any use or occupancy occurring within a quarter, regardless of its duration.

B. The USDA Forest Service estimate of timber sale volume through the facility for the duration of this Short Term Use is 30 million board feet.

00.00.040 **Other Terms, Conditions and Limitations.** Other terms, conditions and Limitations are as contained in the Memorandum of Understanding between the City of Tenakee Springs and the USDA Forest Service for the Short Term Use of Tenakee Springs Tidelands, approved by Resolution 97-11.

00.00.050 **Mayor appointed City's Agent.** The mayor is hereby appointed agent on behalf of the City of Tenakee Springs to execute any and all documents and amendments thereof necessary to accomplish the contents herein.

00.00.070 **Ratification by the Voters.** The value of the land is in excess of $25,000 and in conformance with TSMC 08.01.040B this ordinance shall be referred to the qualified city voters for ratification at the election designated by the City Council.

City of Tenakee Springs

RESOLUTION 97-11

In the Council
August 29, 1996

Introduced by the
Council President

A RESOLUTION FOR THE CITY OF TENAKEE SPRINGS, ALASKA APPROVING THE MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF TENAKEE SPRINGS AND THE USDA FOREST SERVICE FOR THE SHORT TERM USE OF TENAKEE SPRINGS' TIDELANDS AT SUNNY COVE

WHEREAS, the City Council approved, in Resolution 97-09, the preparation of the Short Term Use of the Sunny Cove Tidelands by the USDA Forest Service for a Log Transfer Facility; and

WHEREAS, the preparation for uses of municipal land requires the formulation of terms and conditions; and

WHEREAS, the Memorandum of Understanding between the City of Tenakee Springs and the USDA Forest Service, for the Short Term Use of Tenakee Springs' Log Transfer Facility and Related Tidelands at Sunny Cove, contains terms and conditions for the Short Term Use of the Sunny Cove Tidelands;

THEREFORE BE IT RESOLVED by the Common Council of the City of Tenakee Springs, Alaska, to hereby approve the attached Memorandum of Understanding Between the City of Tenakee Springs and the USDA Forest Service for the Short Term Use of Tenakee Springs' Tidelands at Sunny Cove, Dated November 12, 1996.

BE IT FURTHER RESOLVED to authorize the mayor to sign said Memorandum of Understanding on the city's behalf.

ADOPTED 7 YES THIS 21ST DAY OF NOVEMBER 1996

Louis S. Heins
City Council President
ex officio MAYOR

ATTEST:
Janice J. Eagle
City Clerk

☆ U.S. GOVERNMENT PRINTING OFFICE: 1999 — 689-113 / 41973 Region No. 10

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To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.